

# Computer Science: what's it about?

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UNIVERSITY OF  
OXFORD

Department of  
COMPUTER  
SCIENCE

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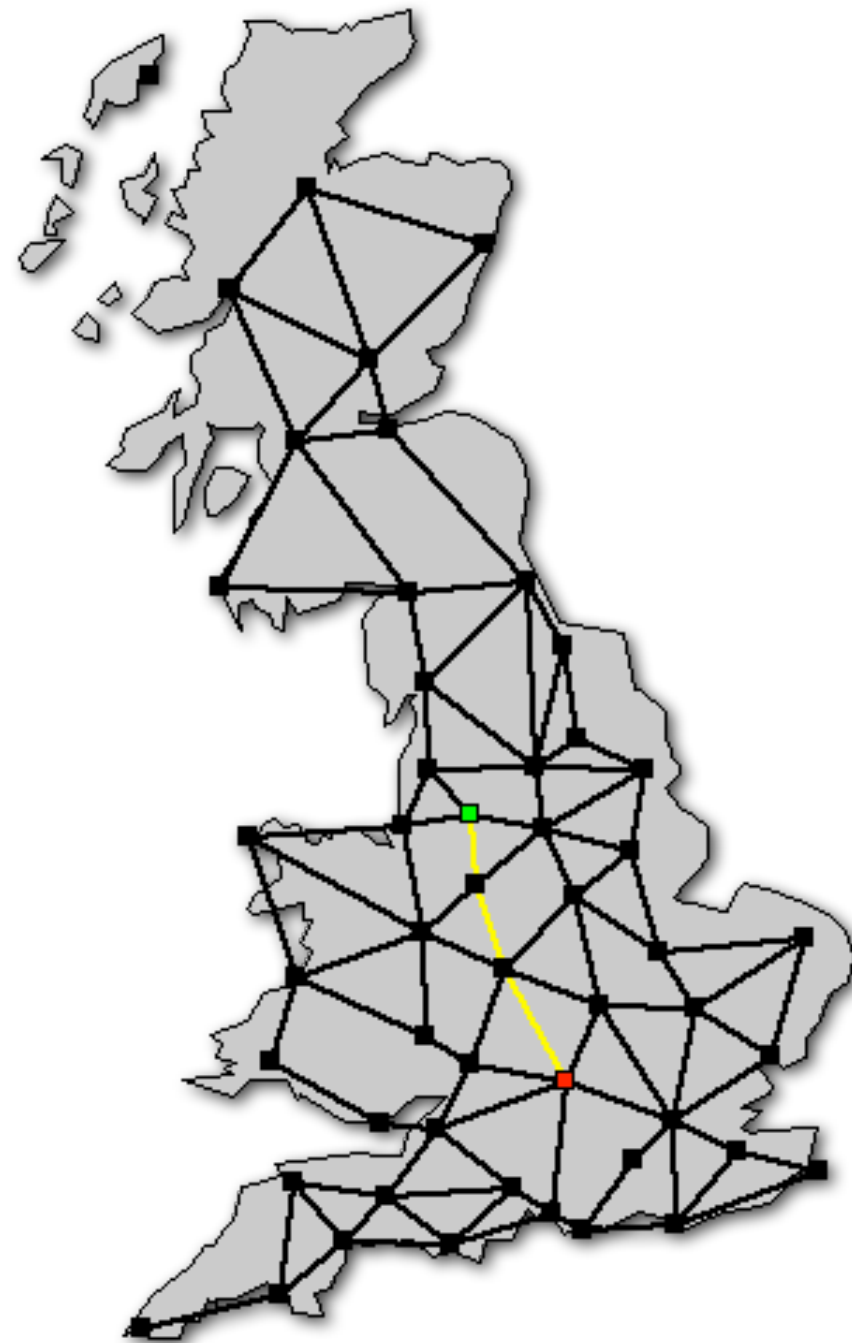
# Computer Science

- What is Computer Science about?
- The Oxford [& Cambridge] courses
- Why Oxford [or Cambridge]?
- The application process

# What's it about?

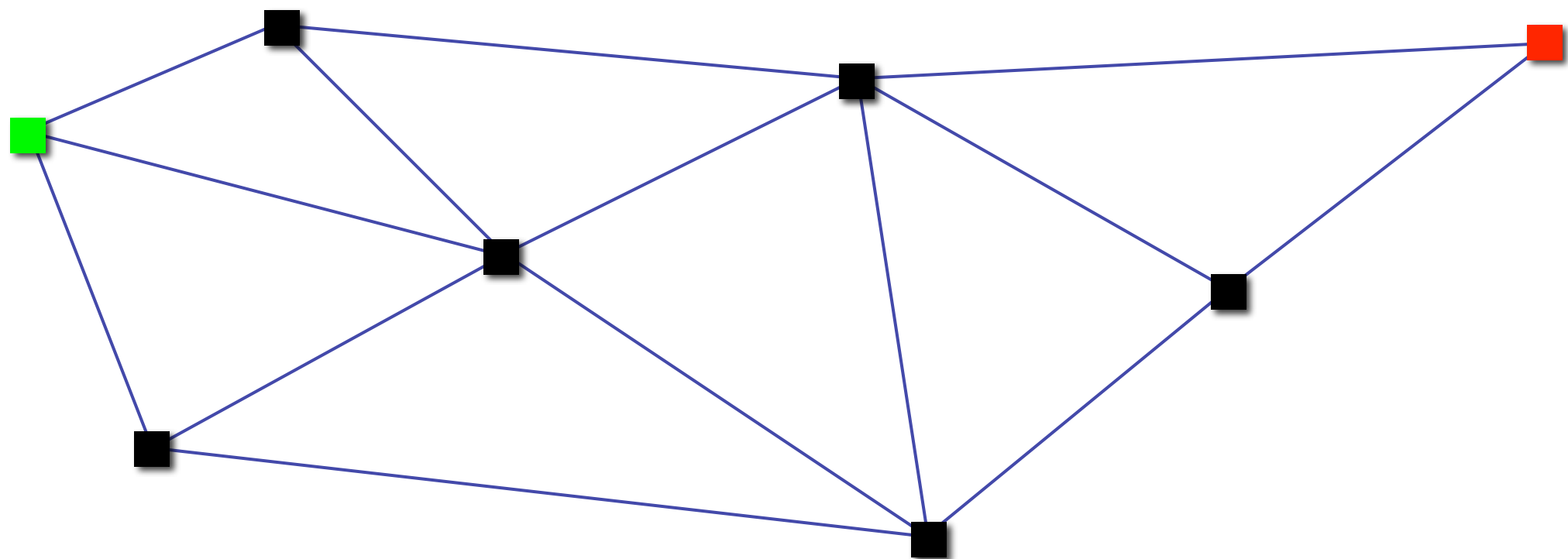
Or, how can you drive  
from Manchester to  
Oxford?

And how can you get a  
computer to show you  
the way?



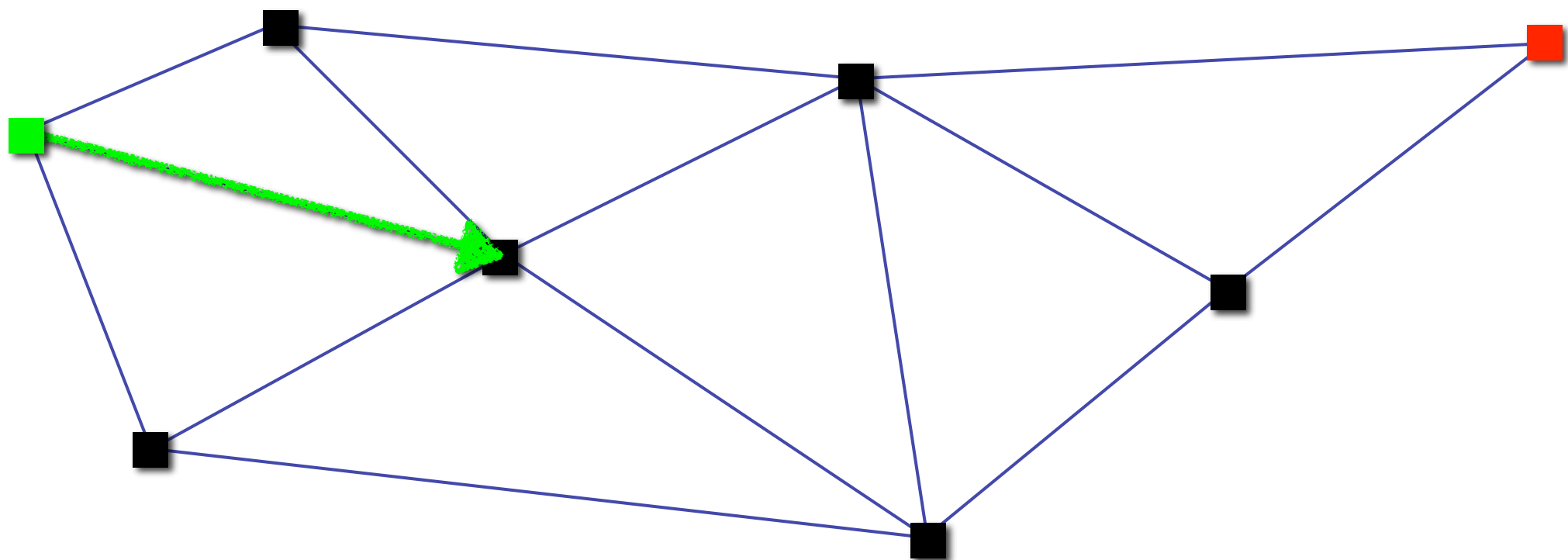
# Method A

*“Always go in the direction that takes you most directly towards Oxford.”*



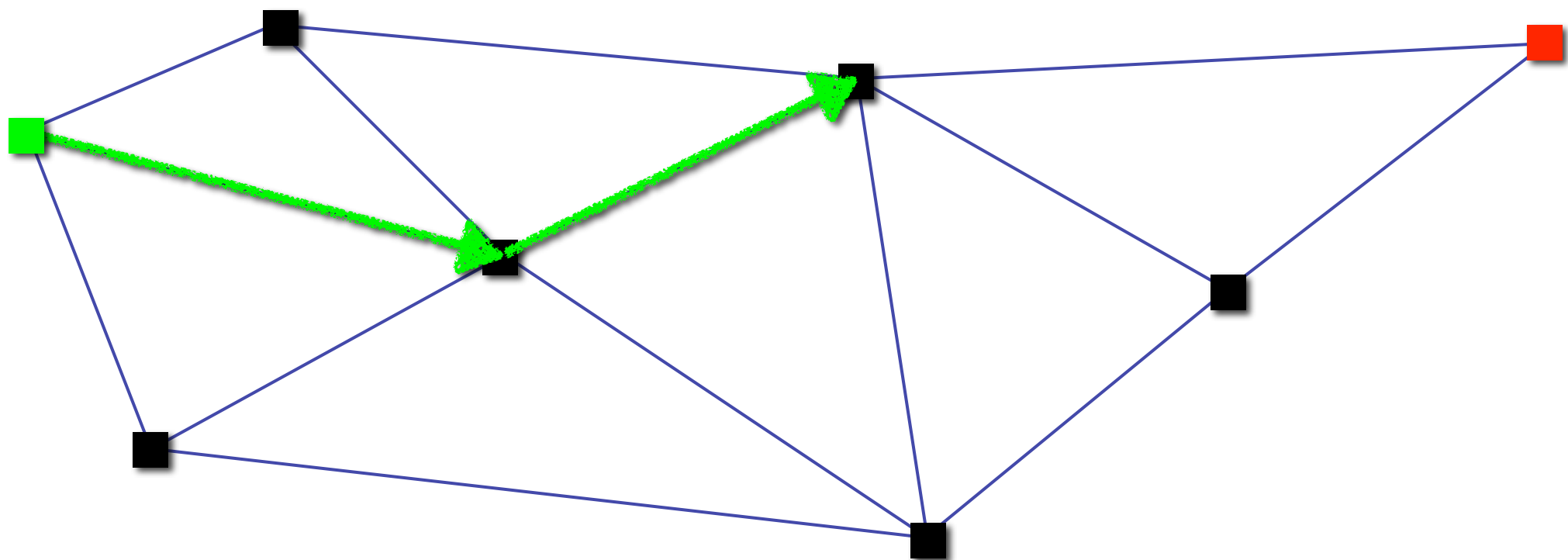
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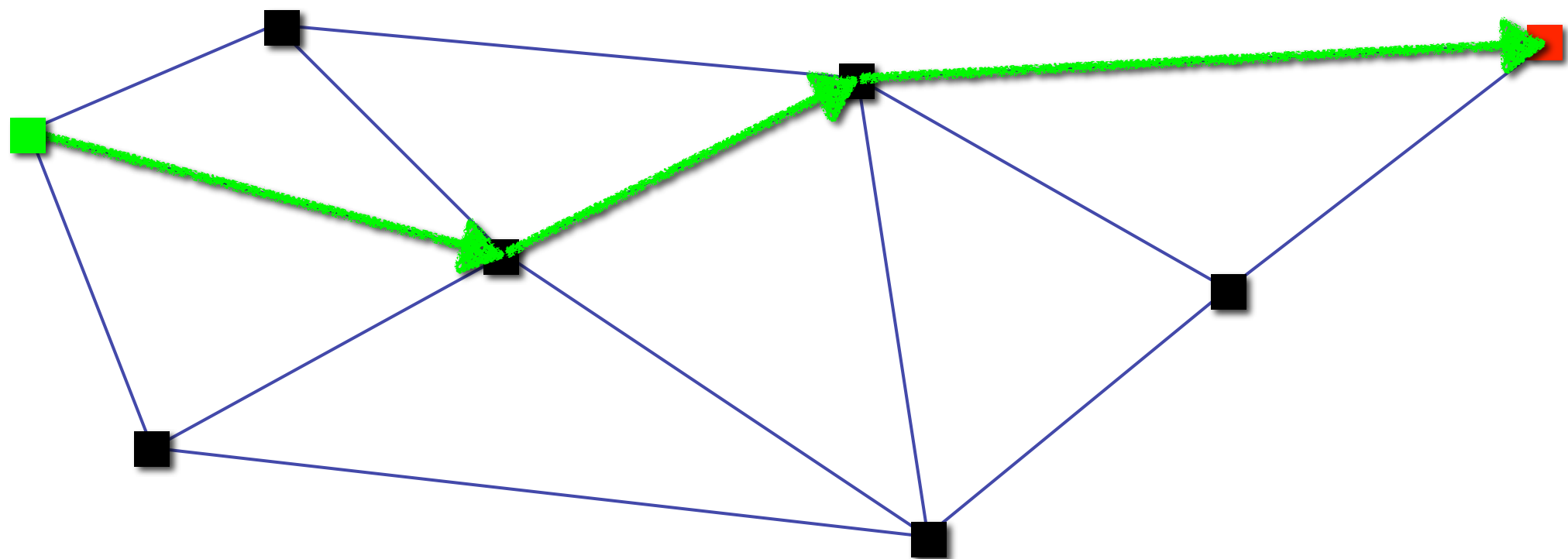
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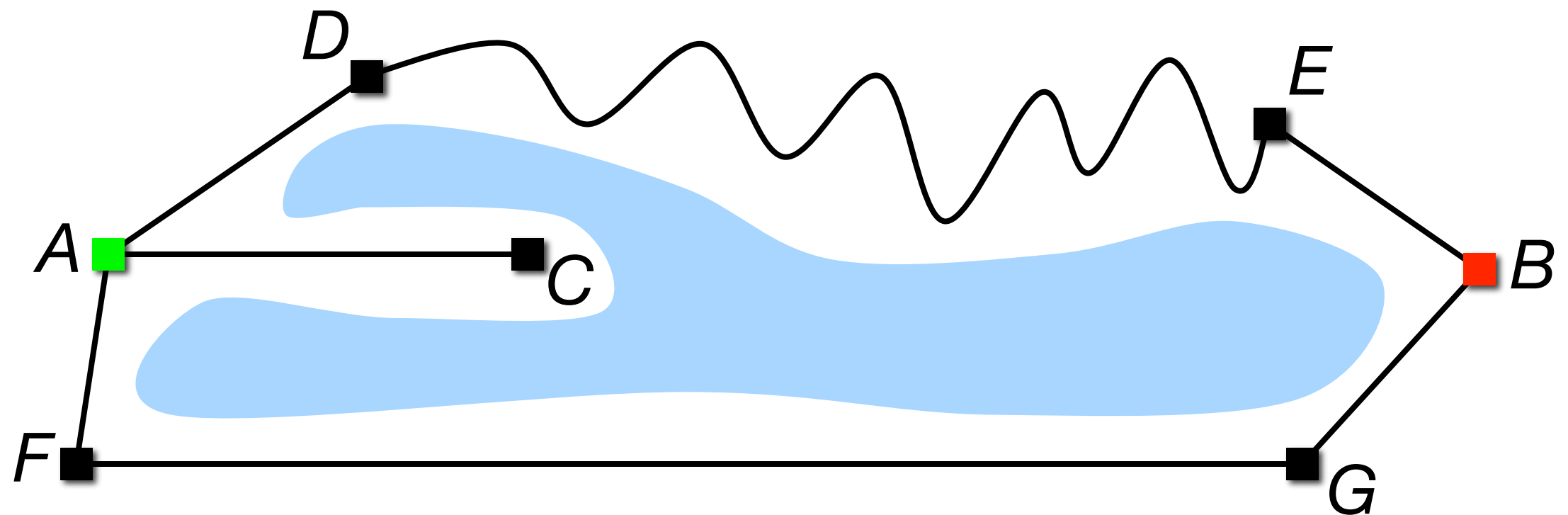


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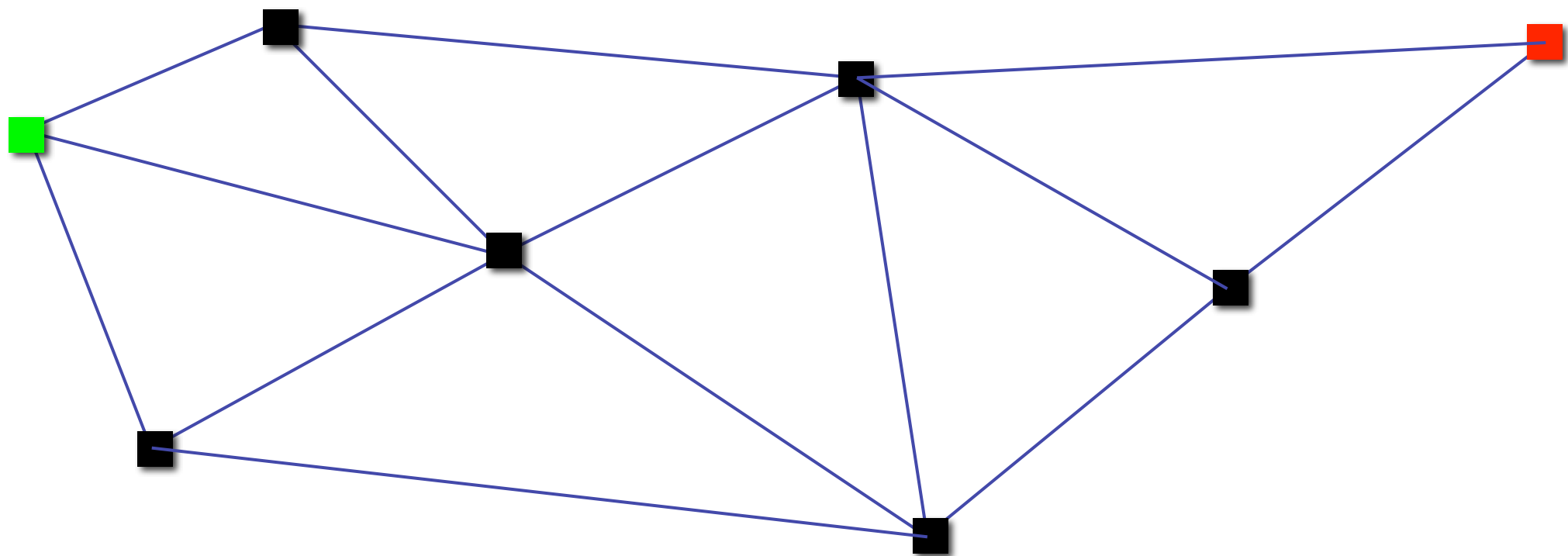
# How good is it?





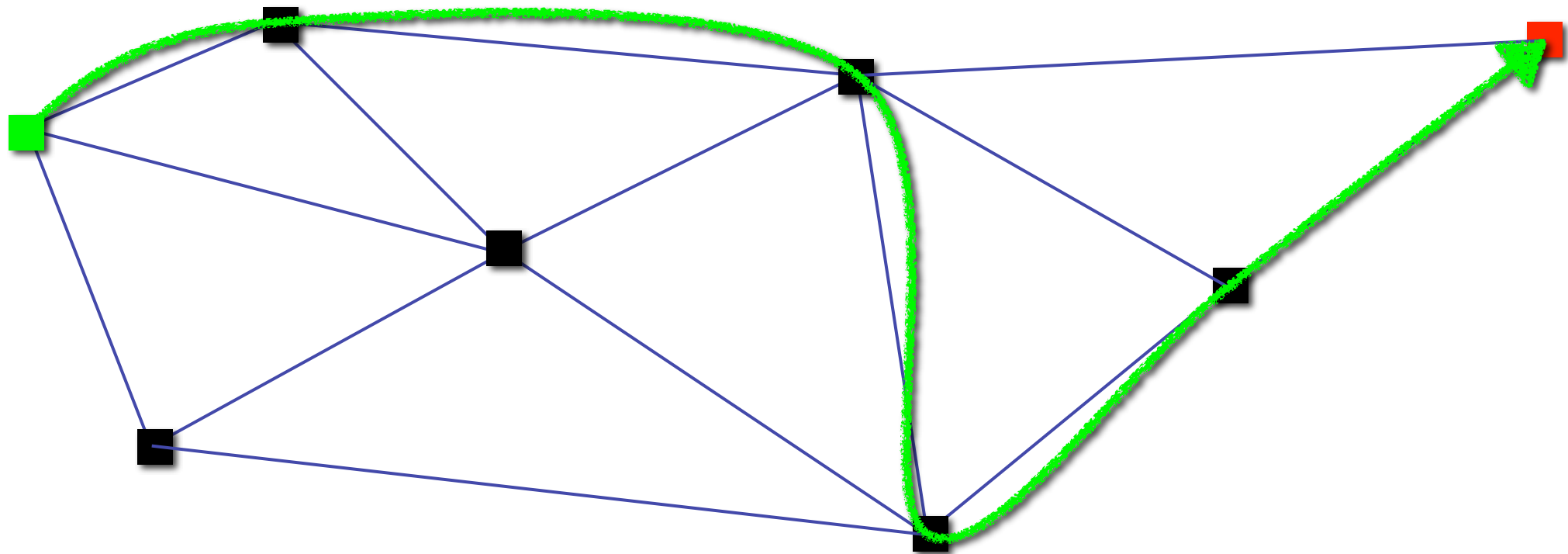
# Method B

*“Consider all routes from home to Oxford, and choose the shortest.”*



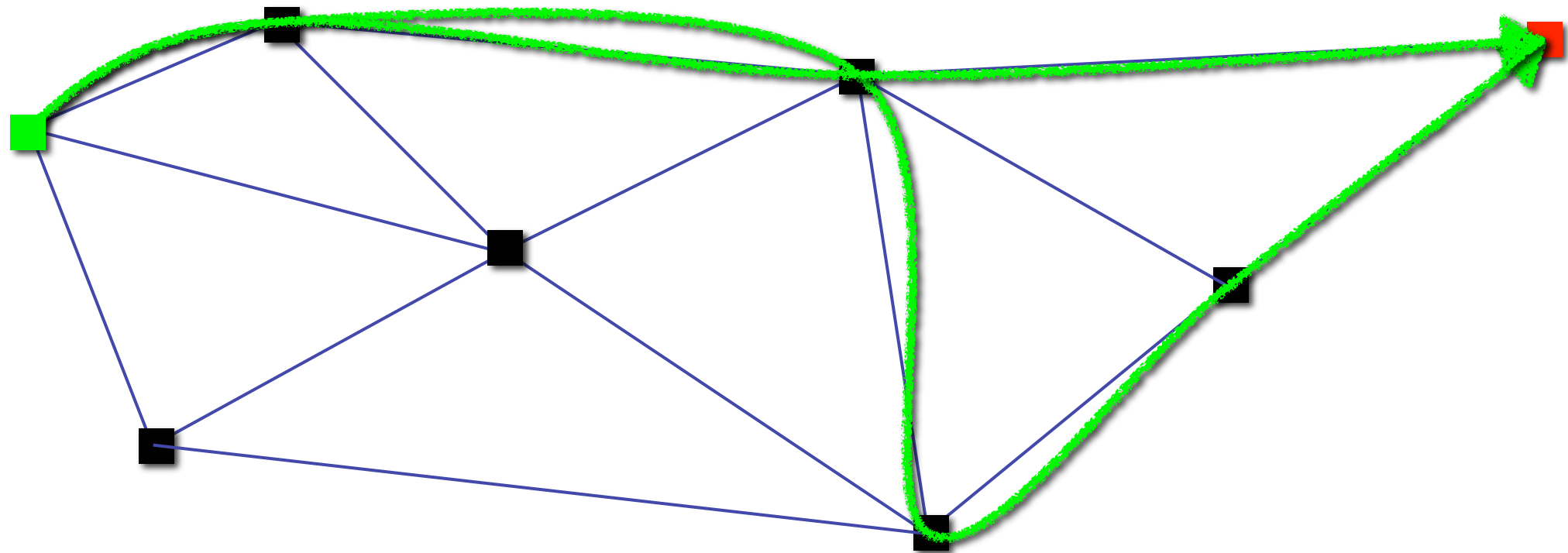
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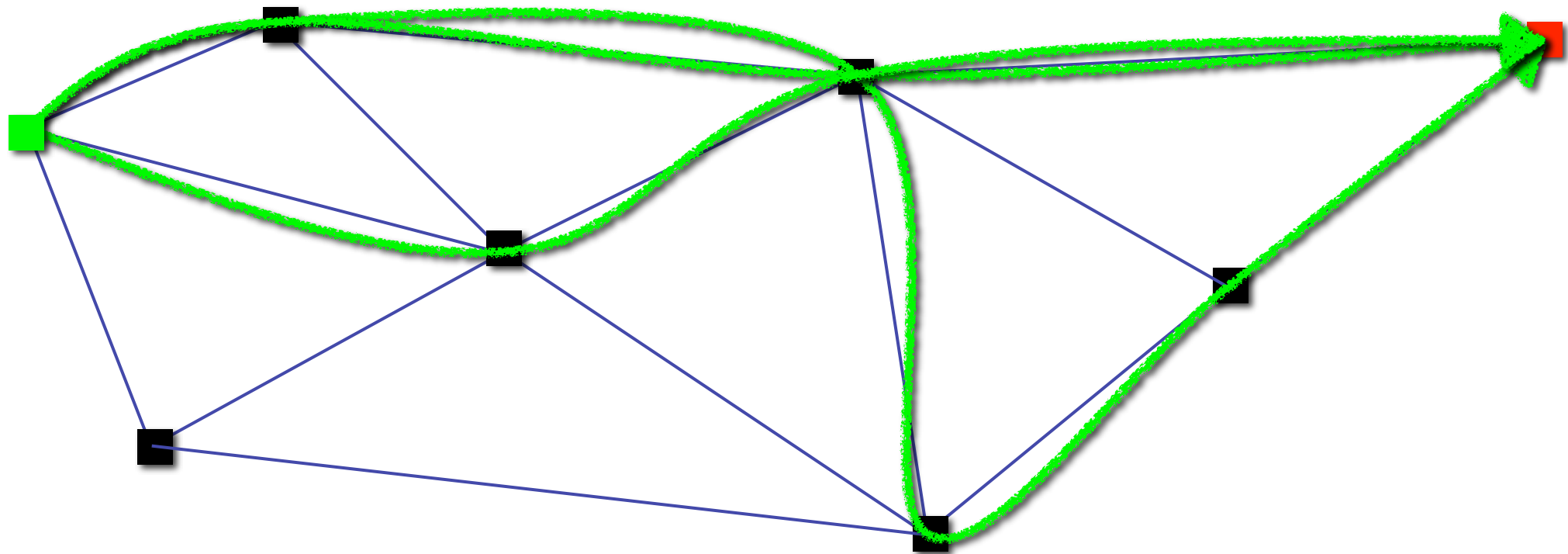
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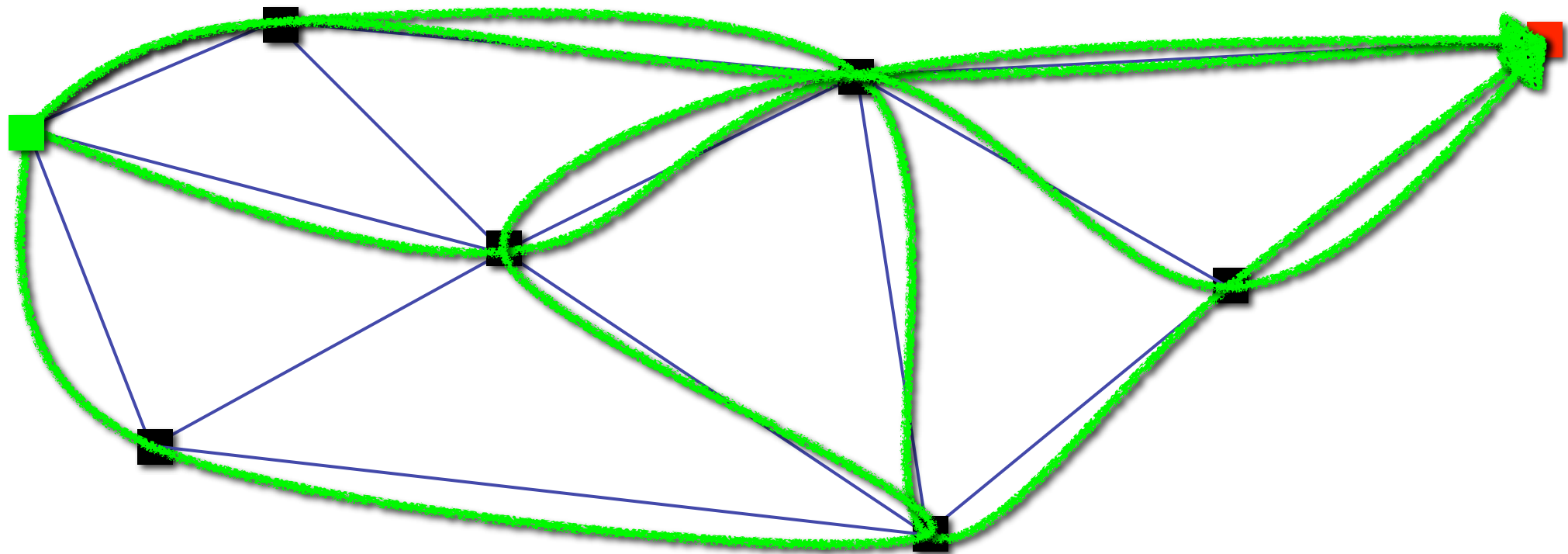
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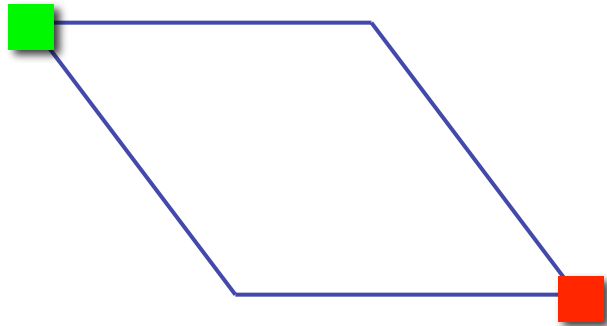


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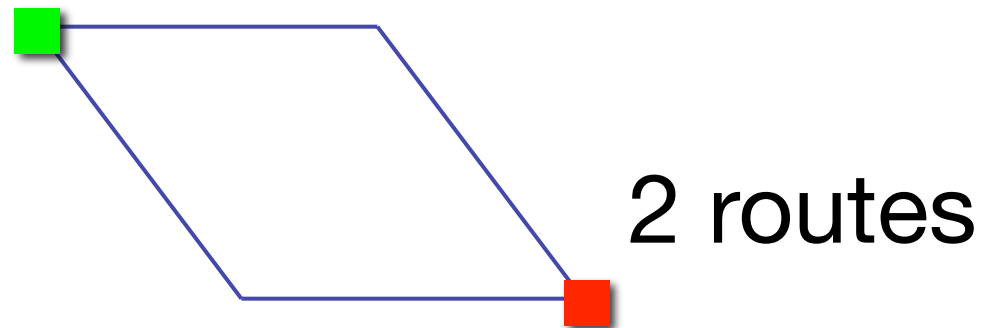
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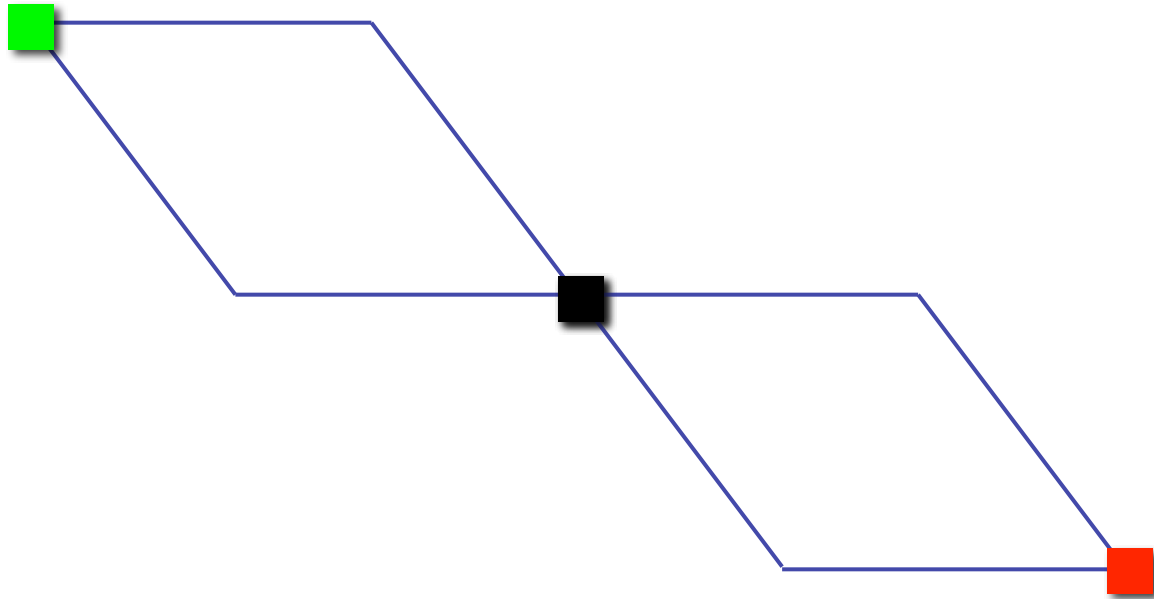
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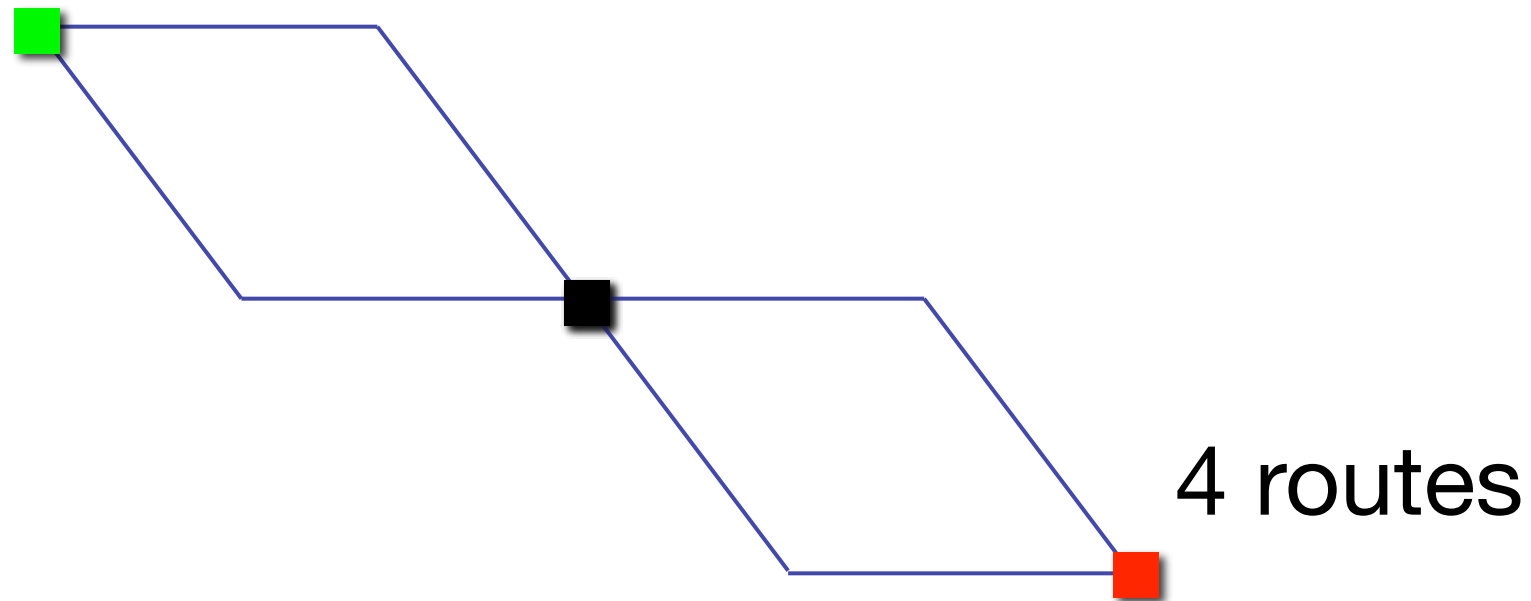


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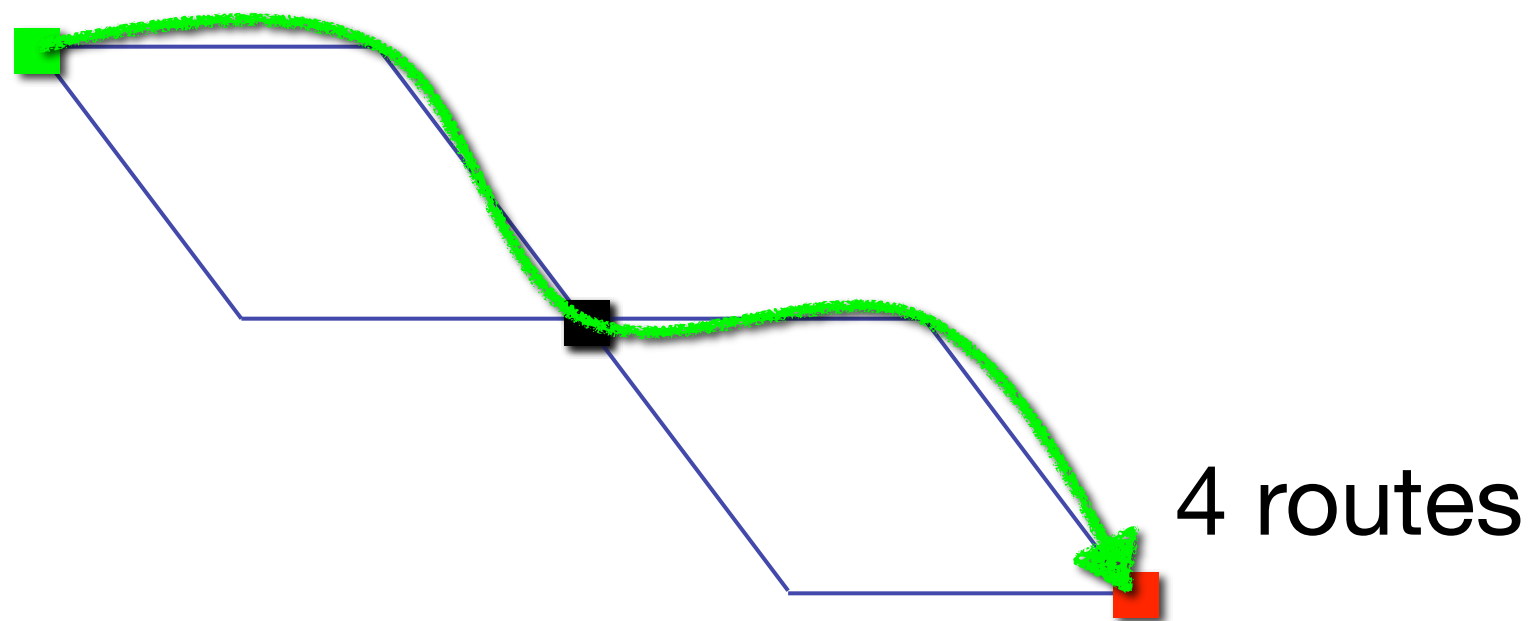




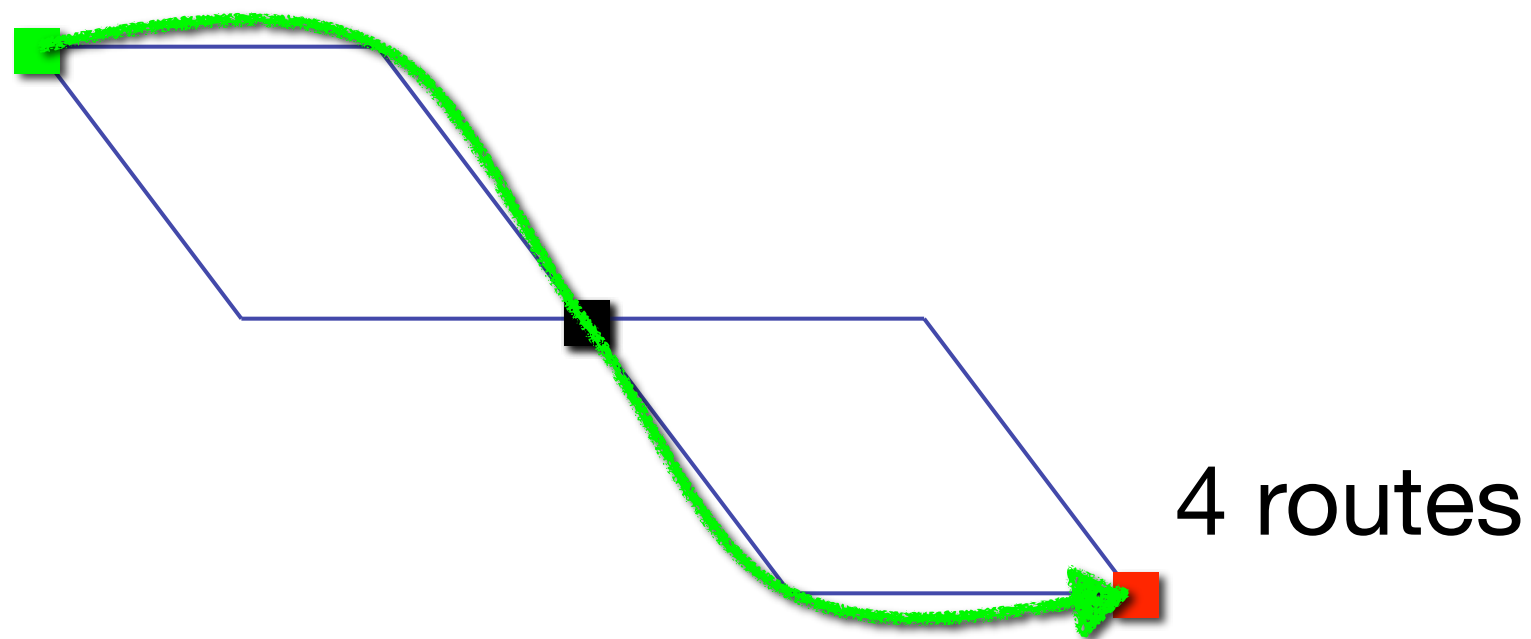
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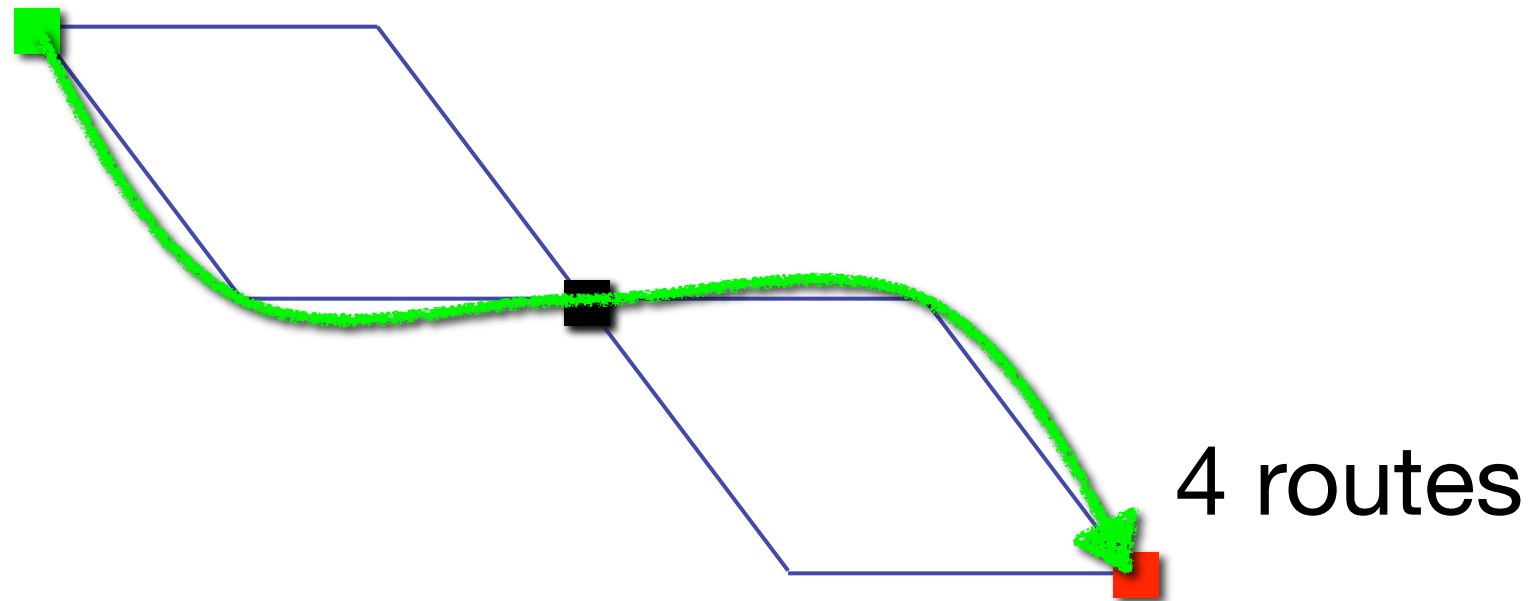
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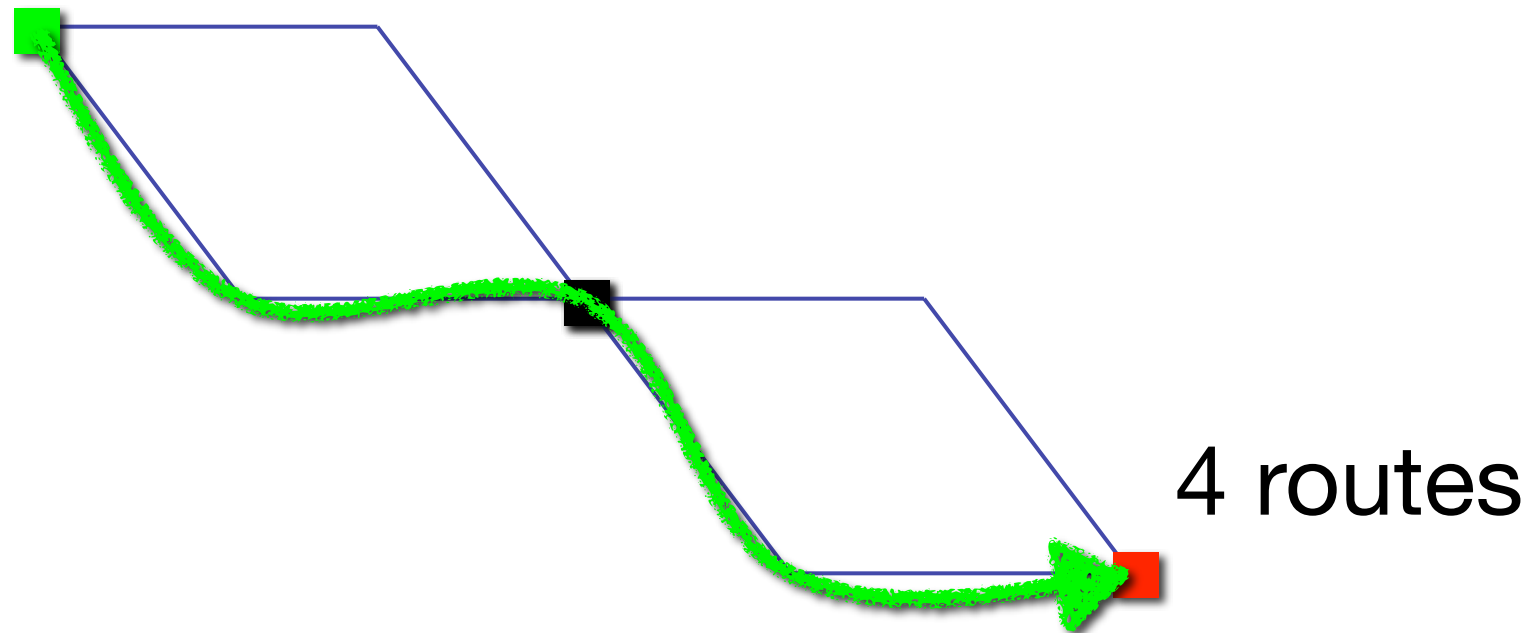
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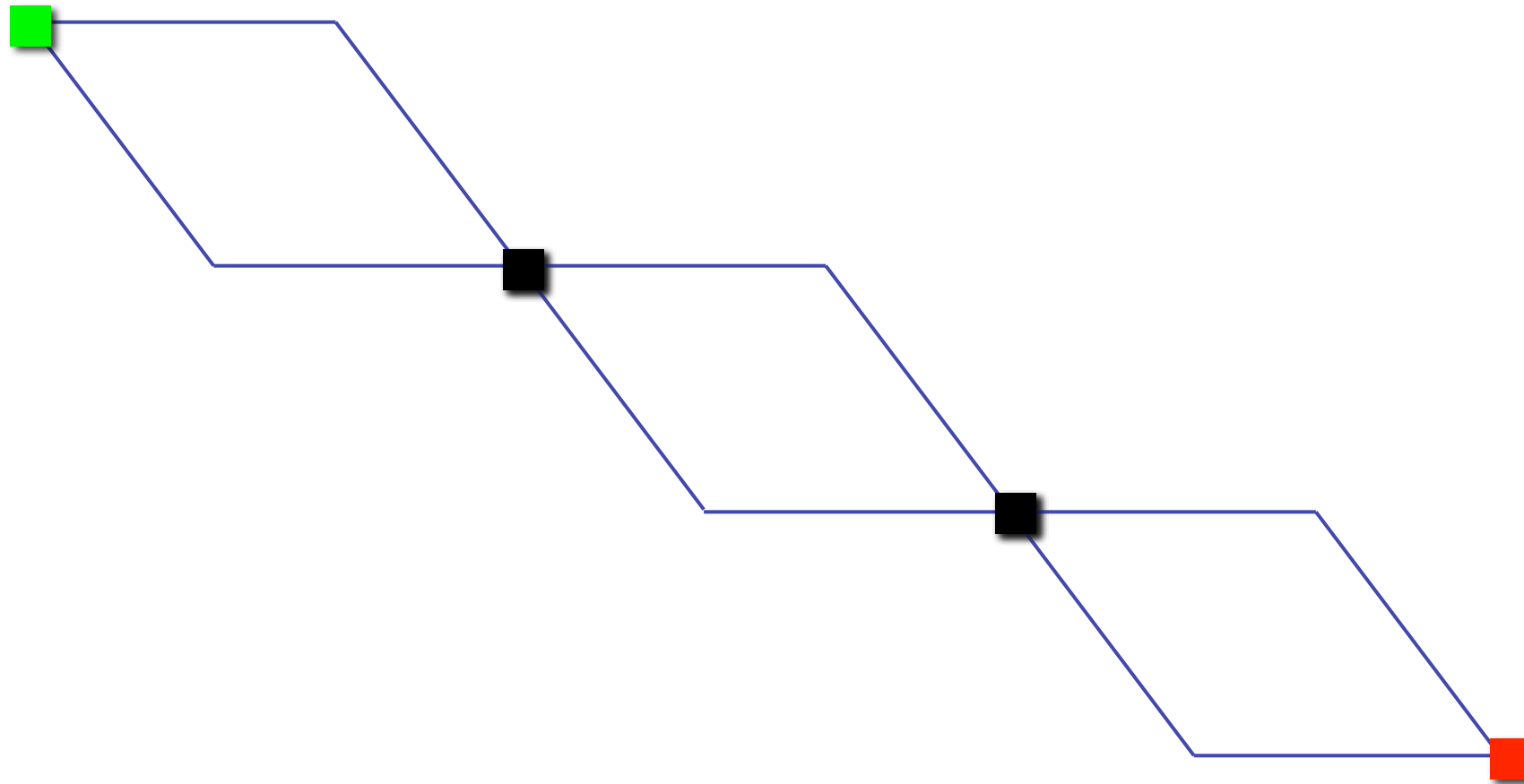
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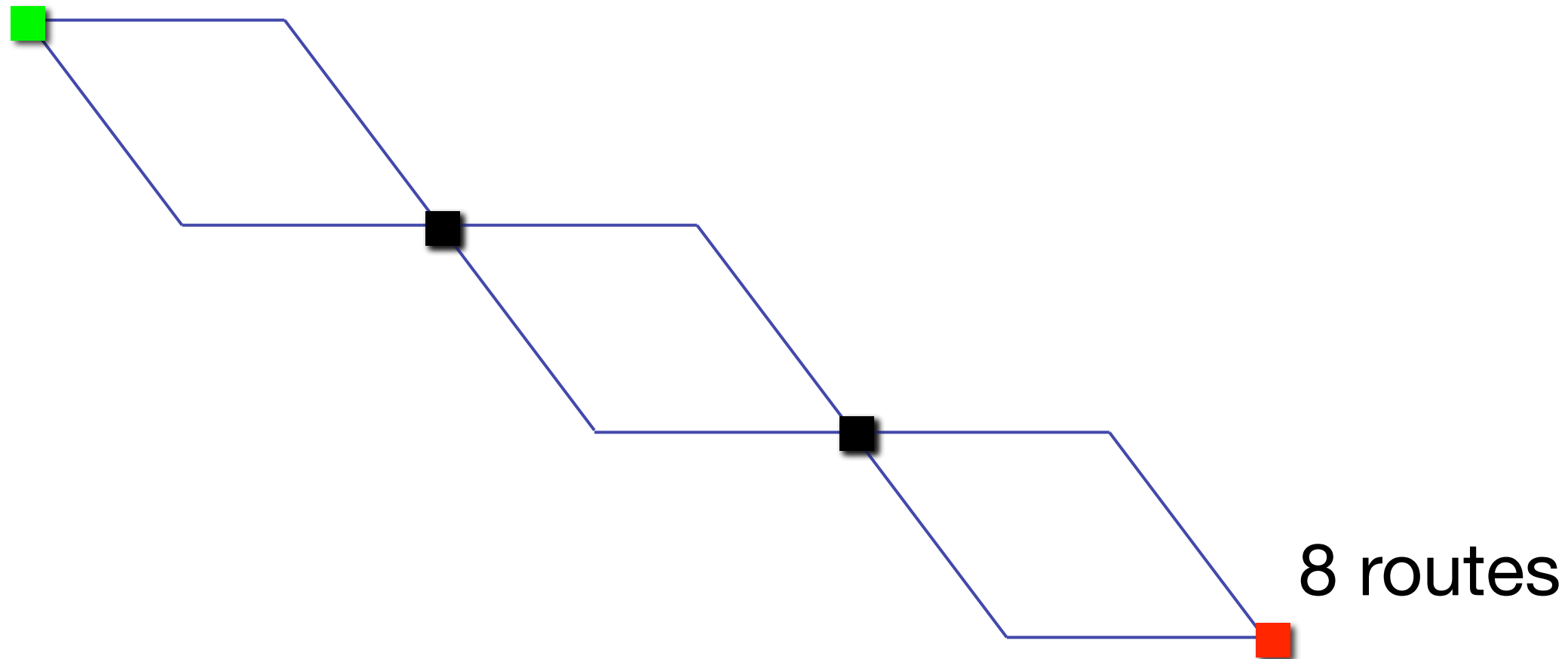
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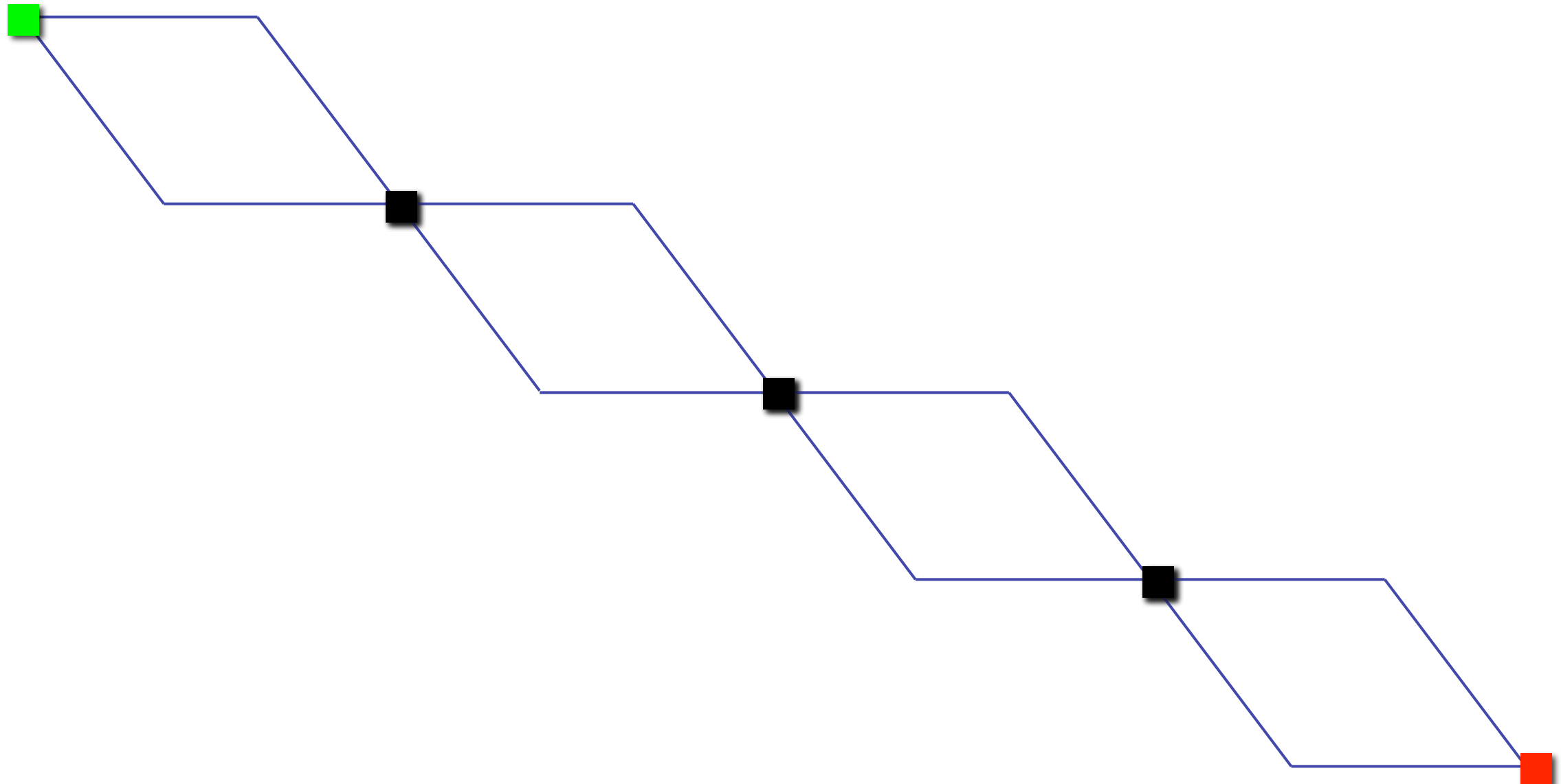
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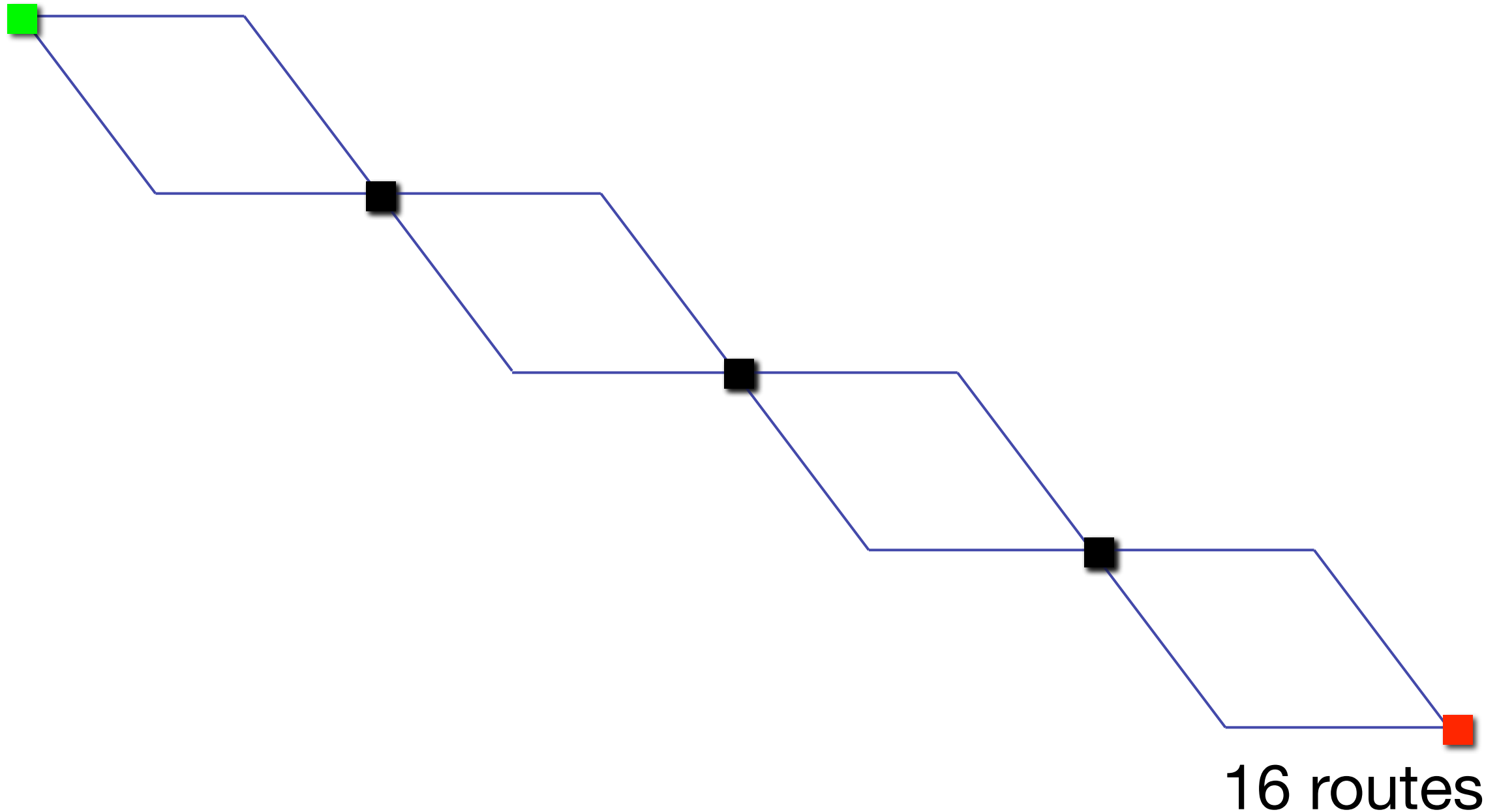


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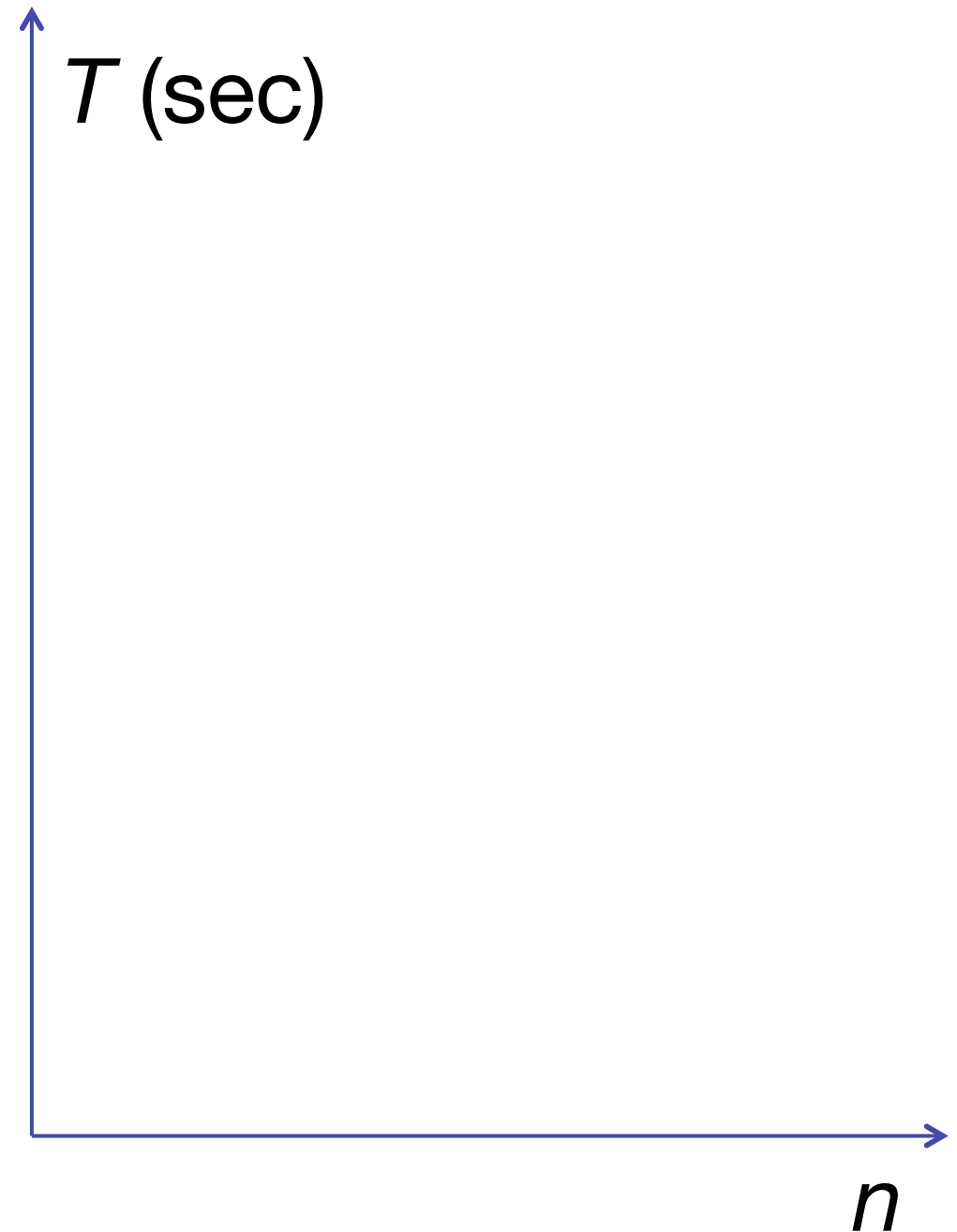


# Starts slow and gets slower

$$T \approx 2^{n/3}$$

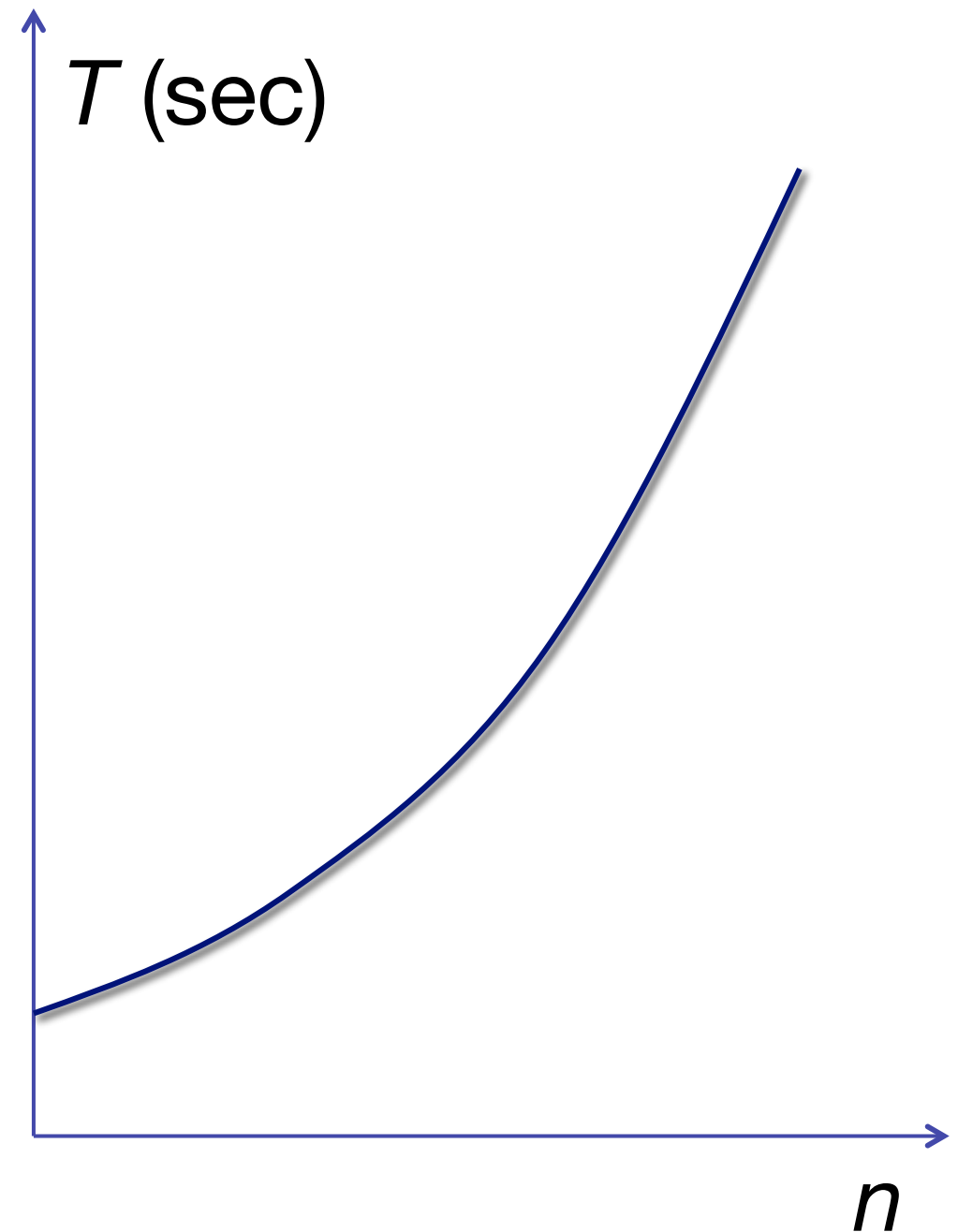
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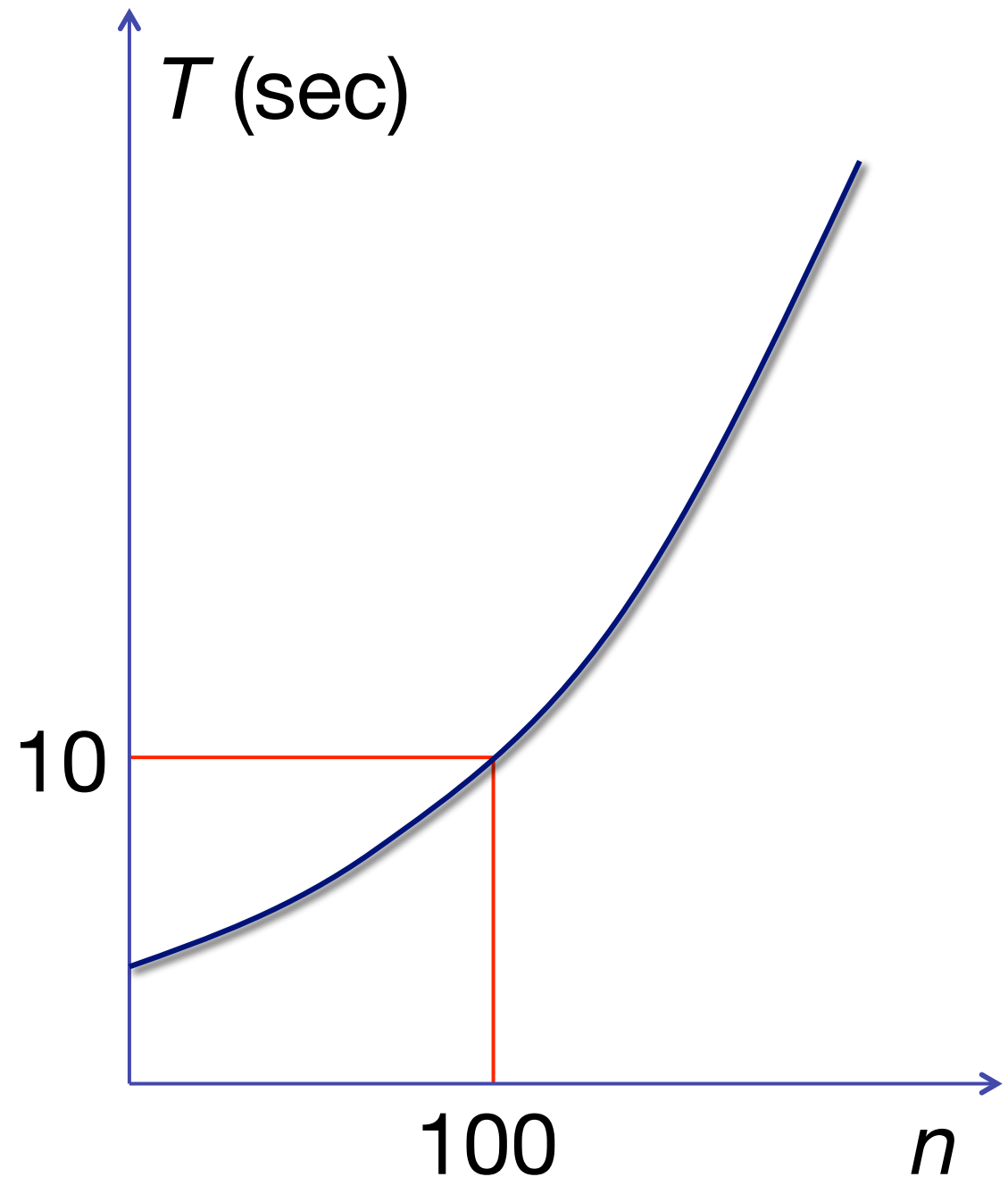
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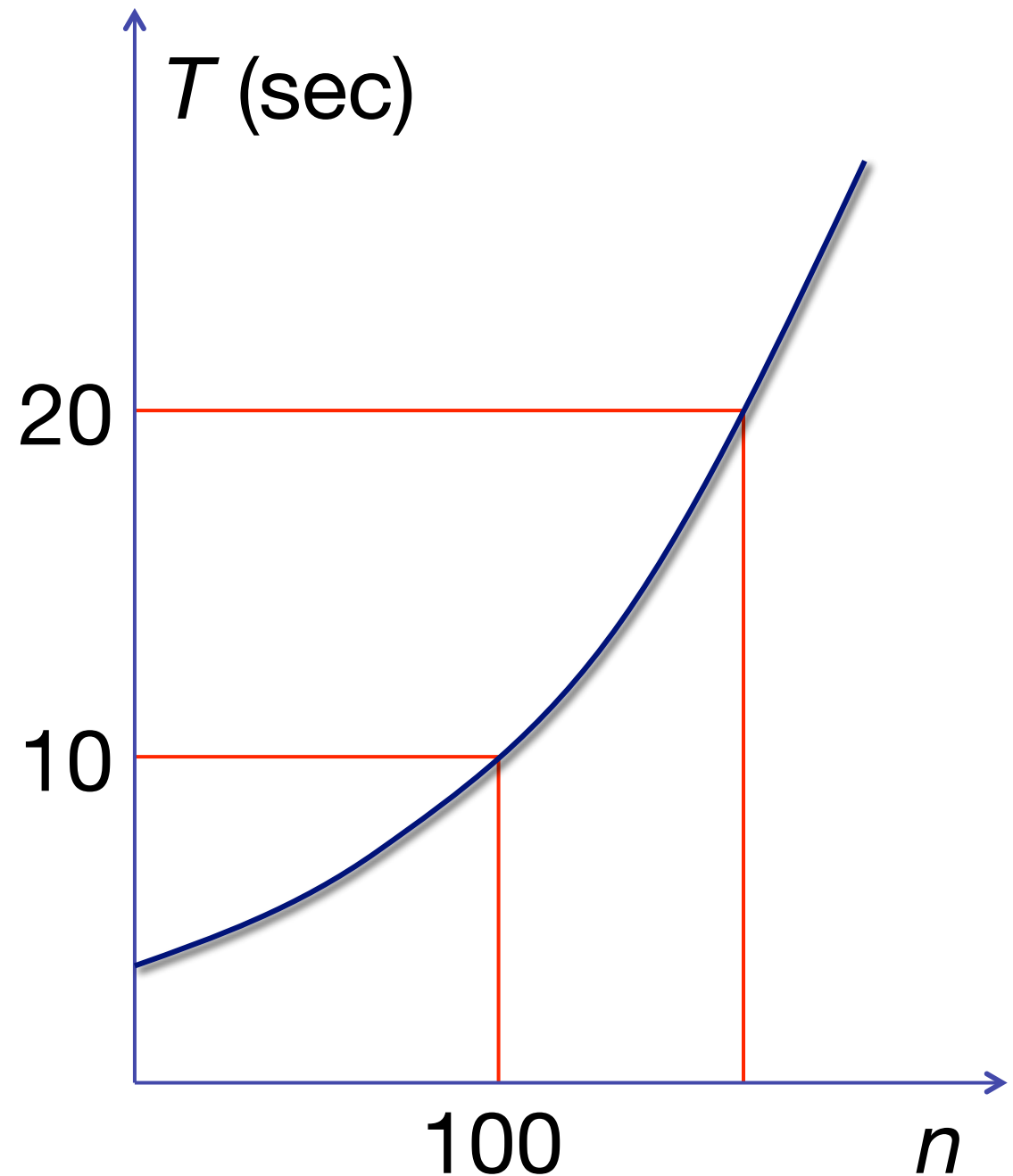
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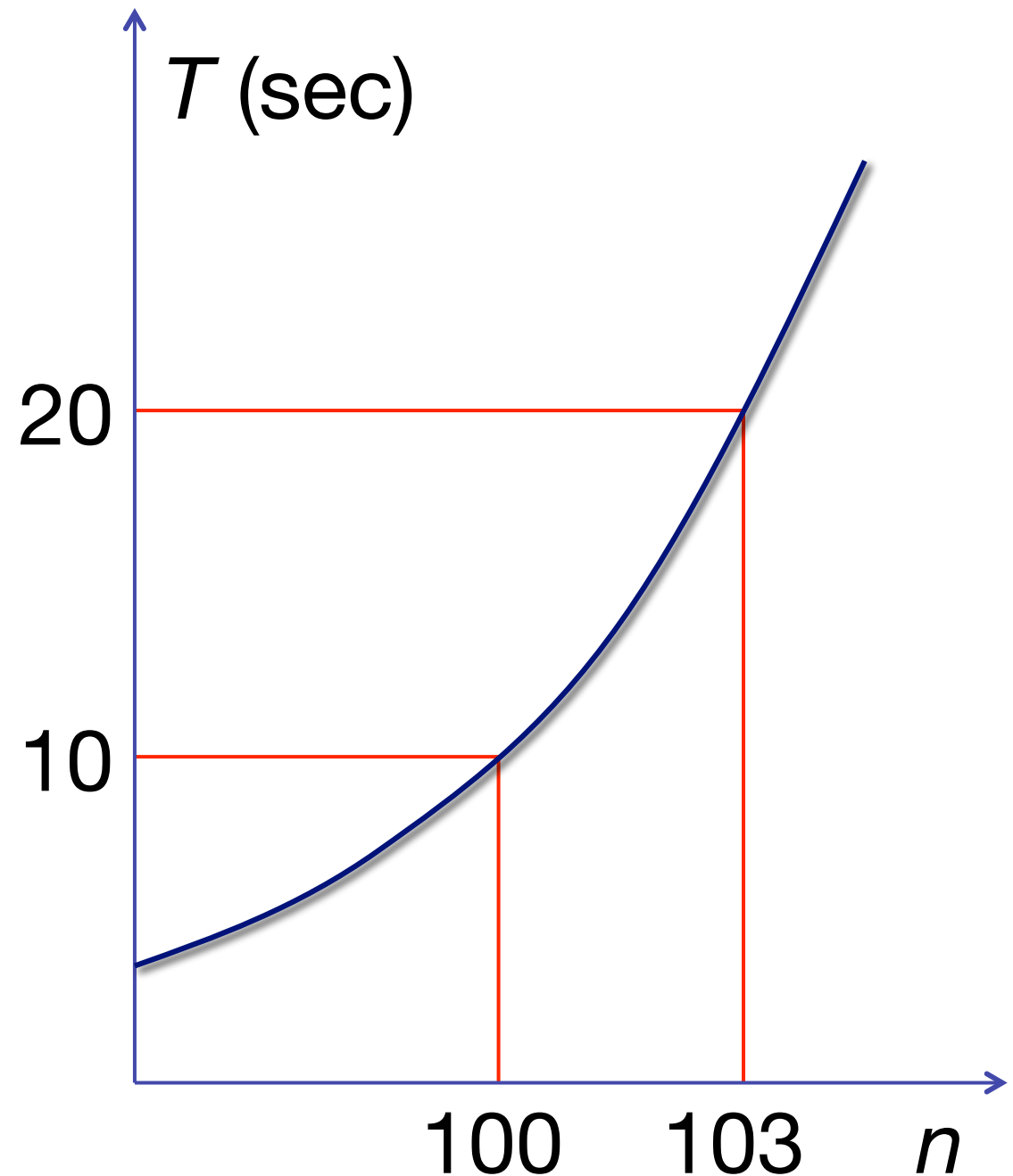
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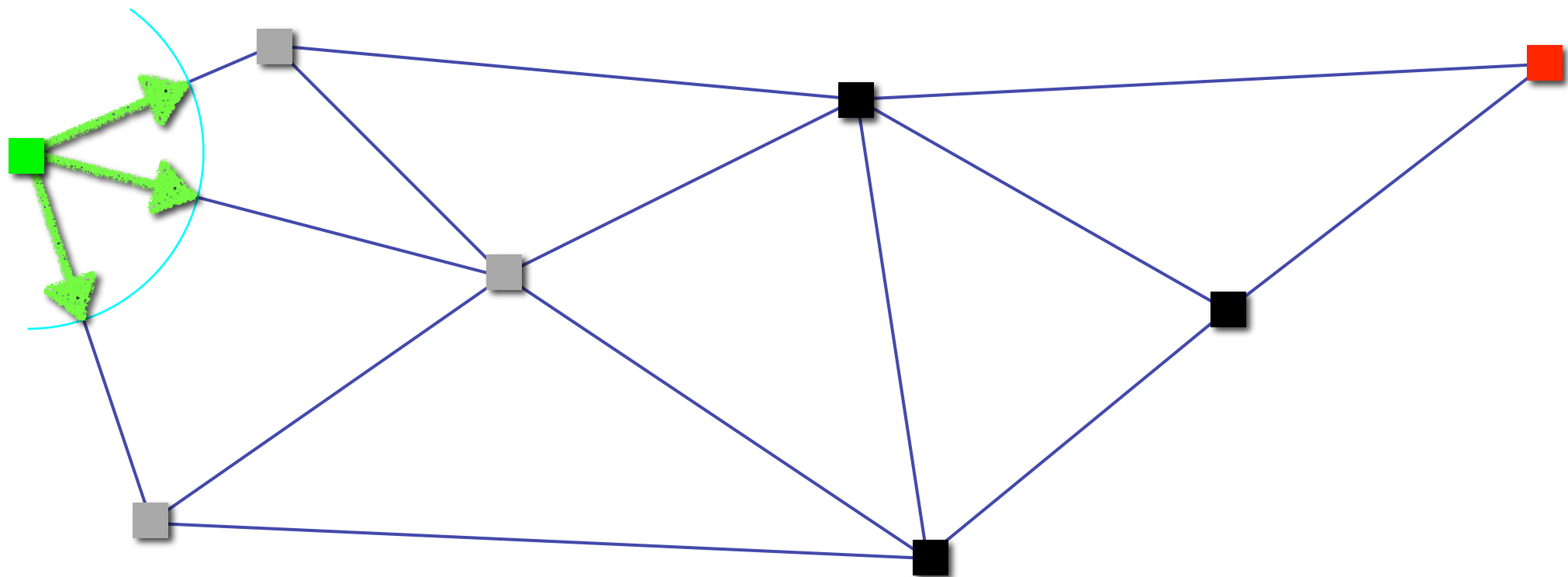


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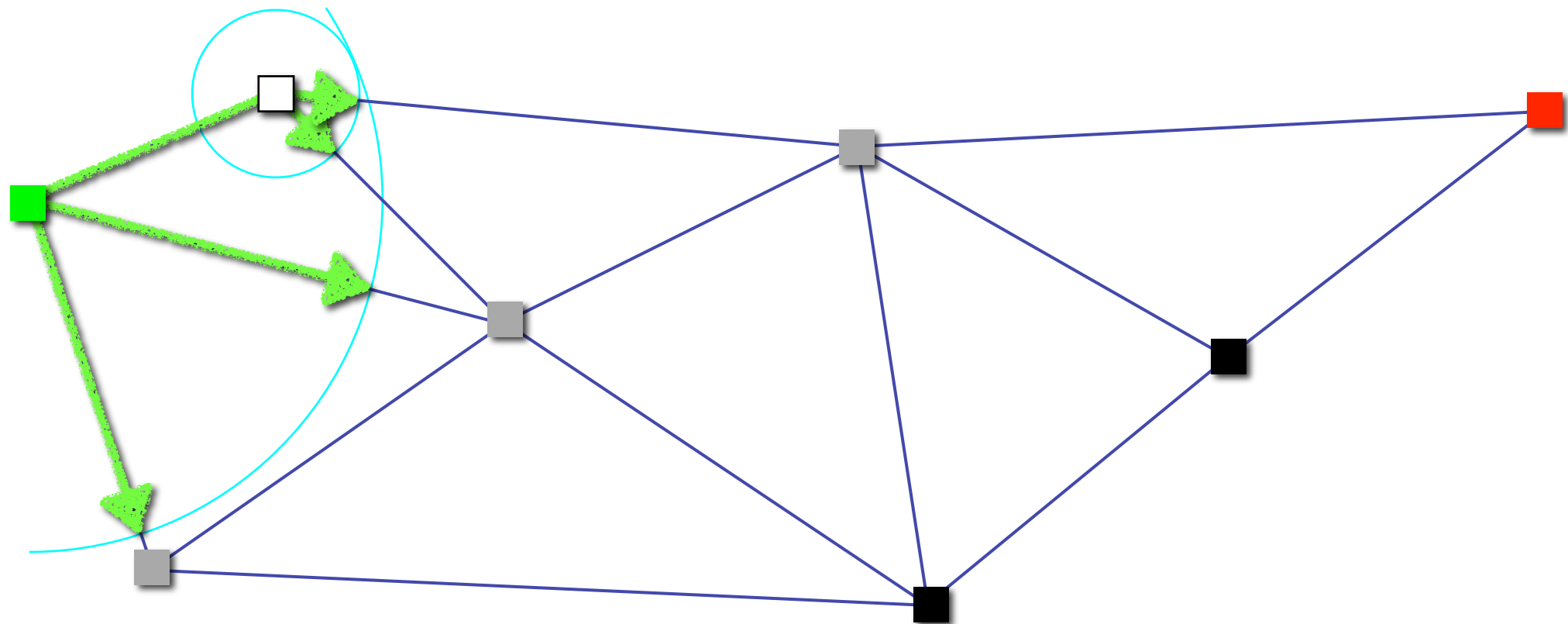


# Method C

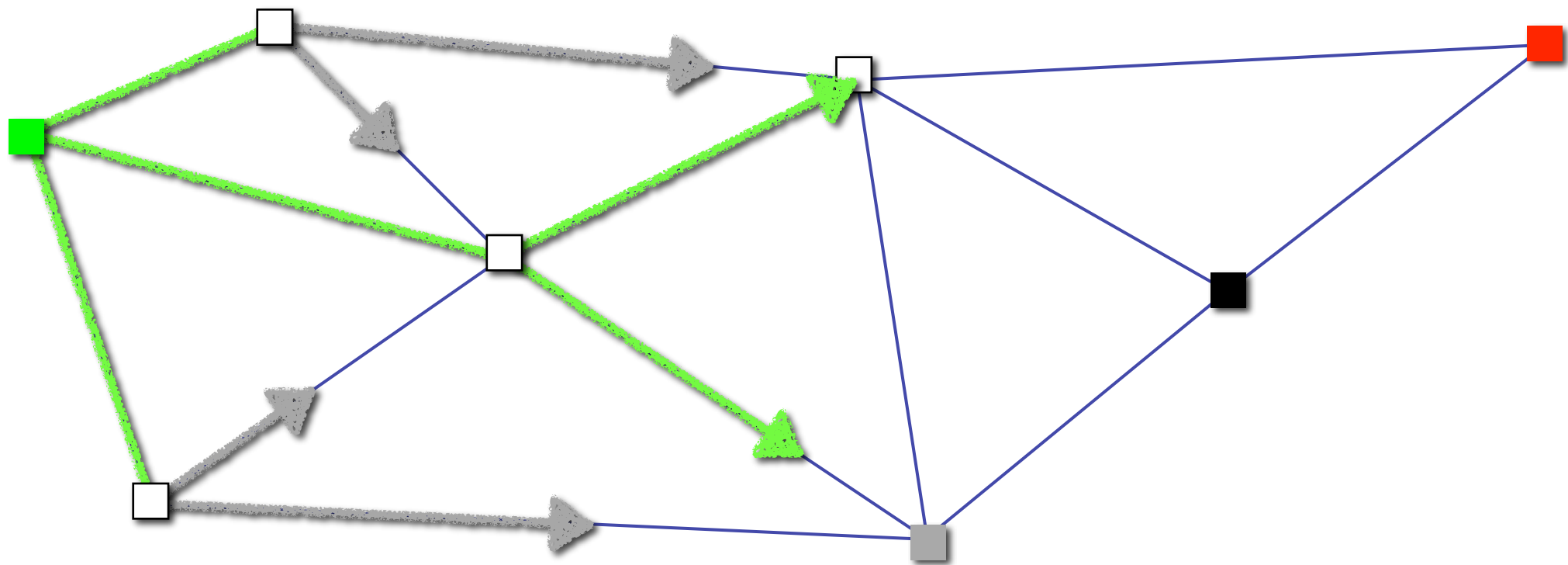




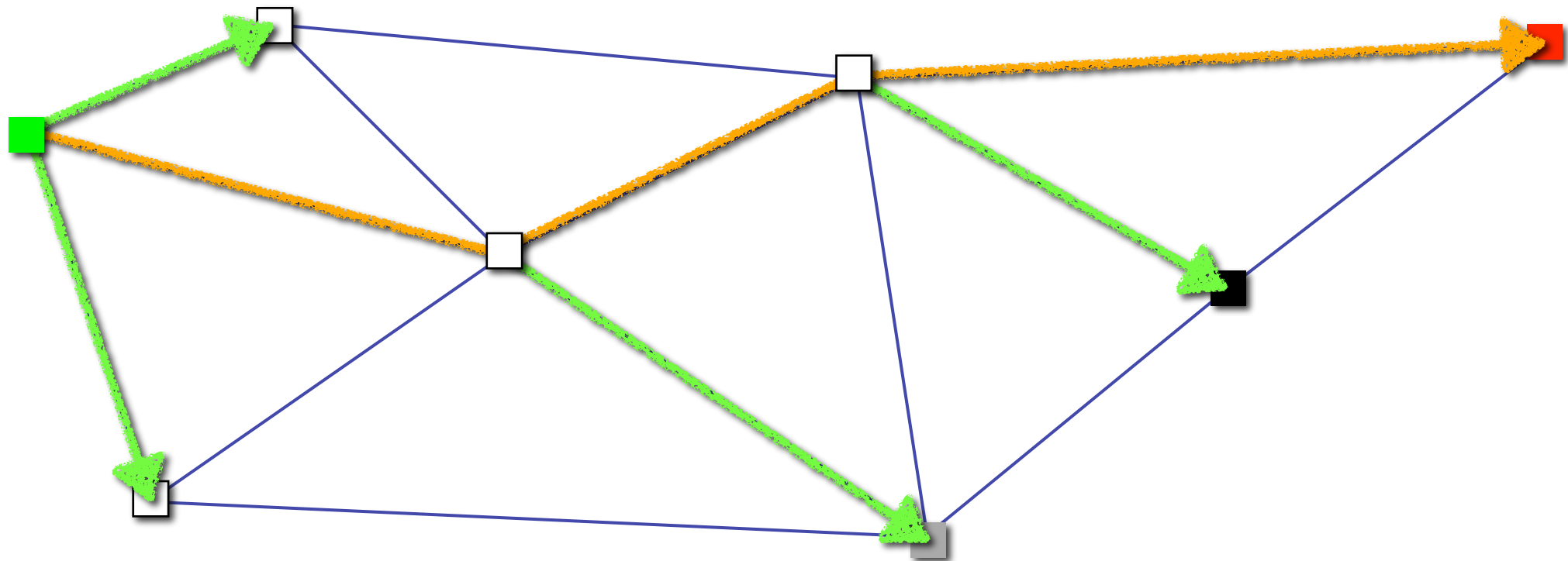
# Capturing a town



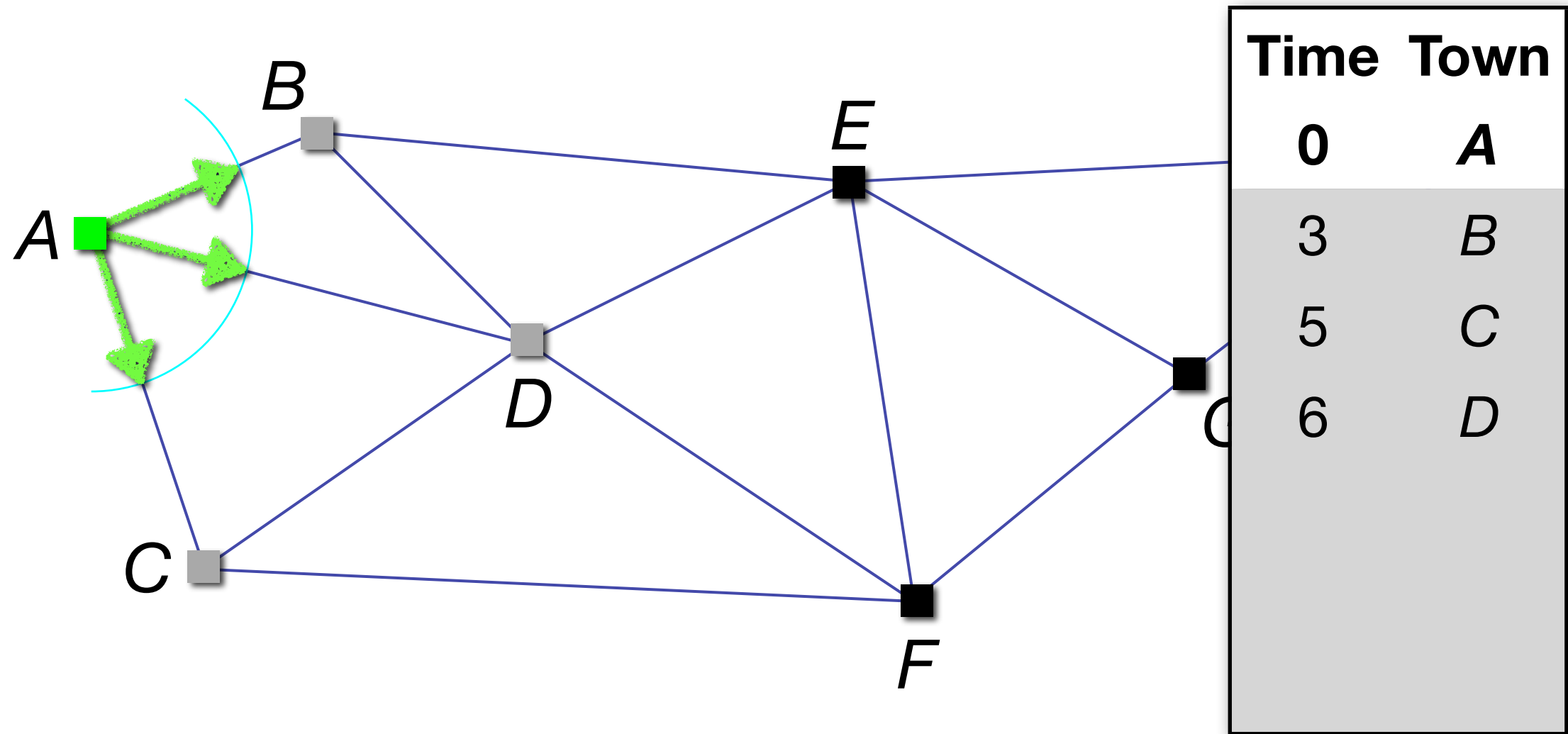
# Keeping focussed



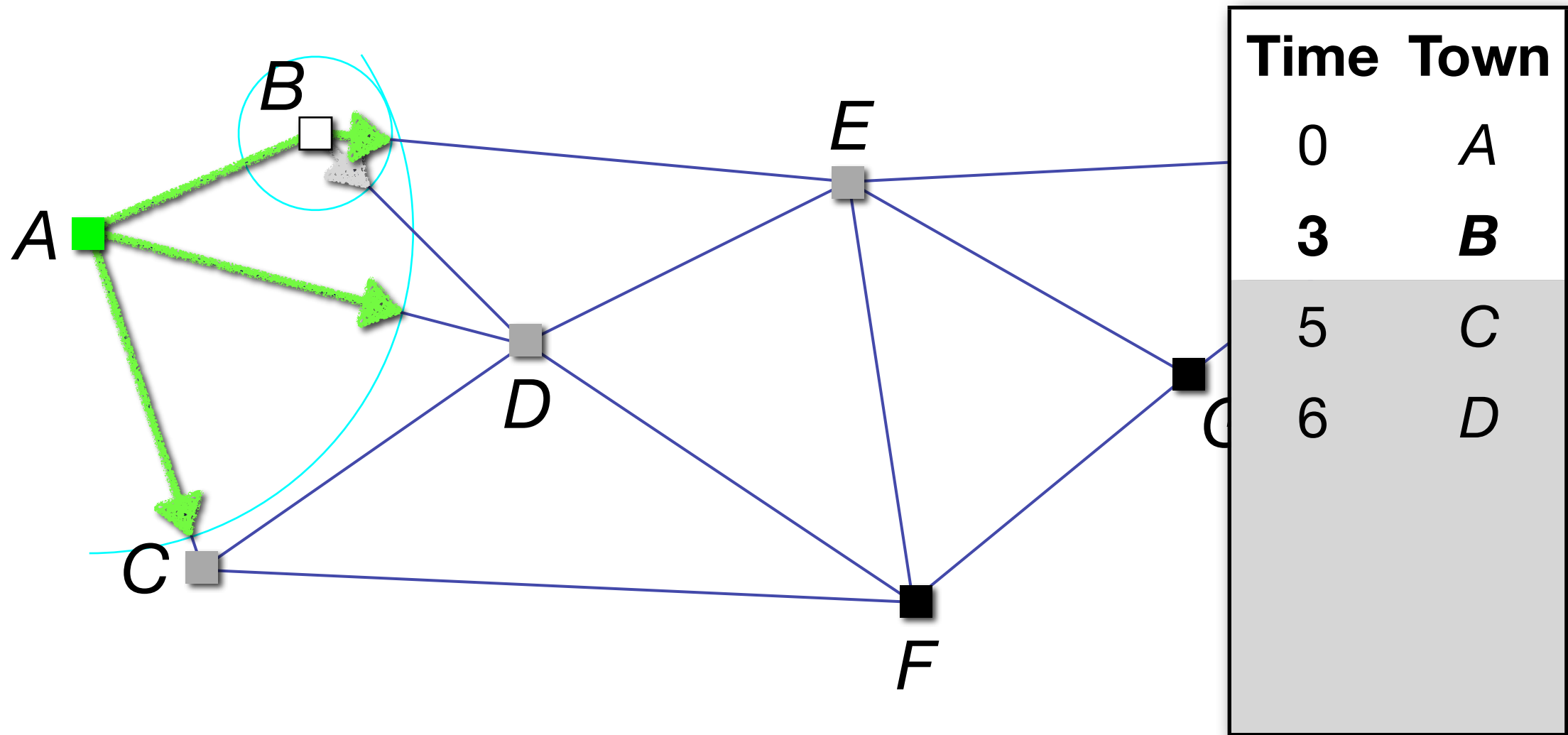
# Achieving the goal



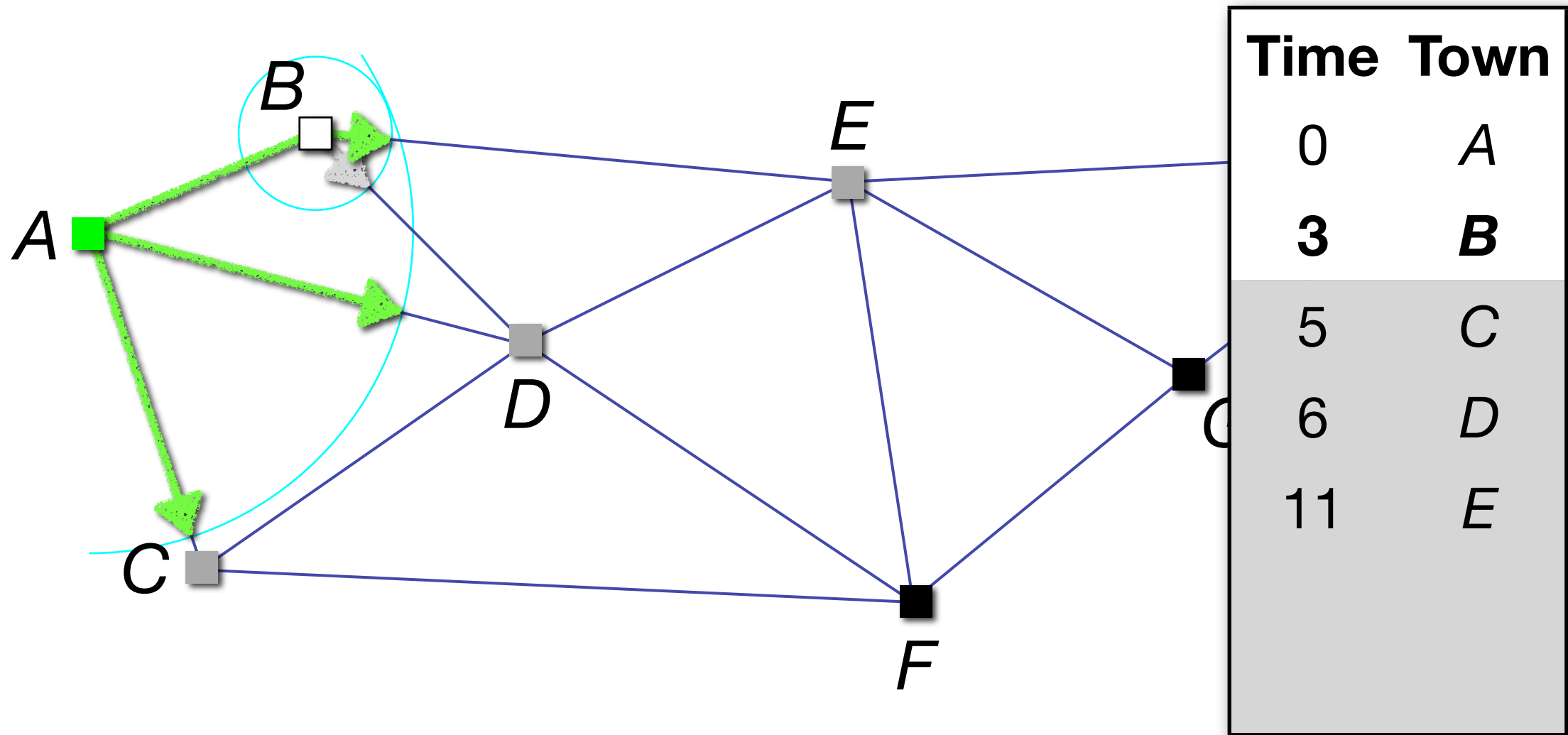
# Making it efficient



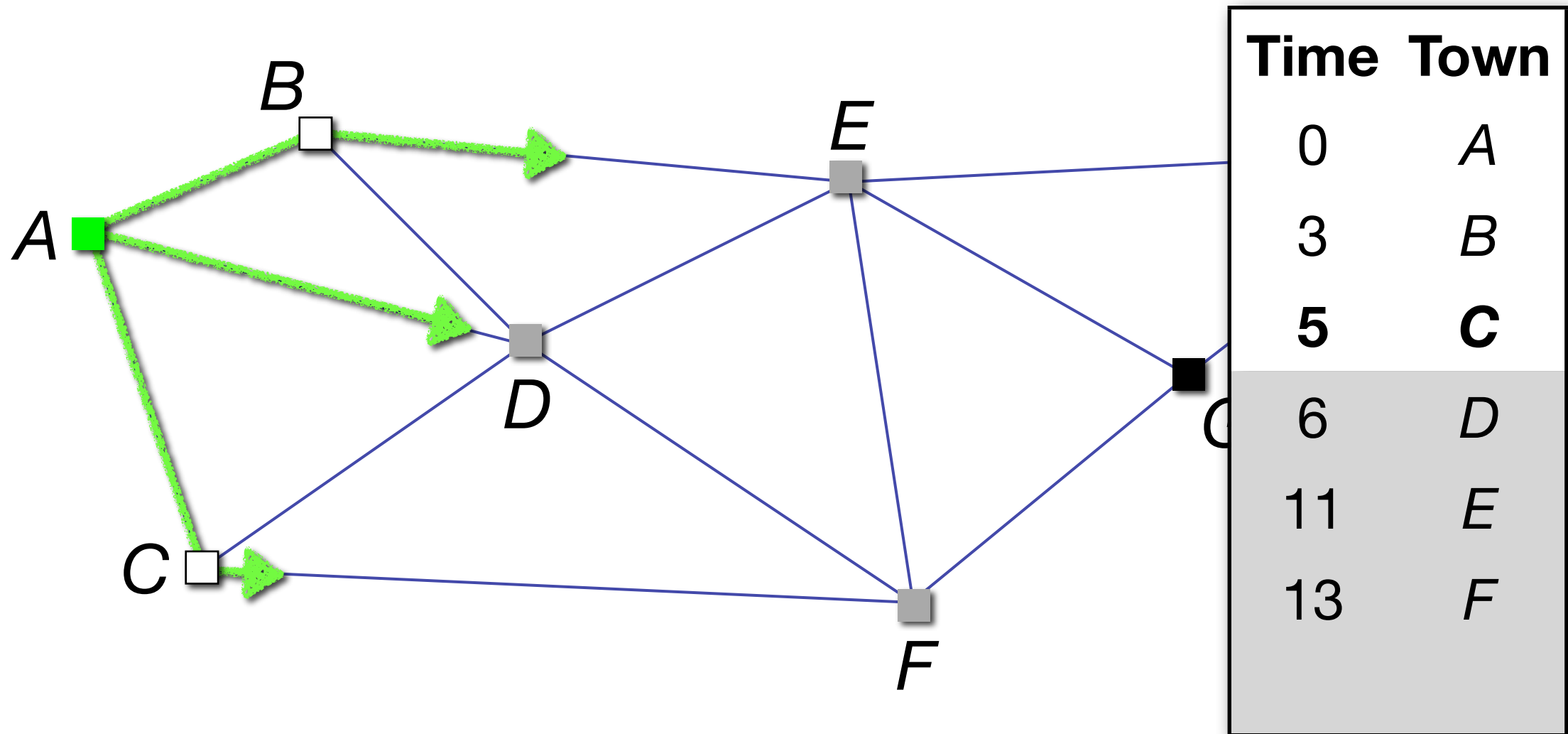
# Using the agenda



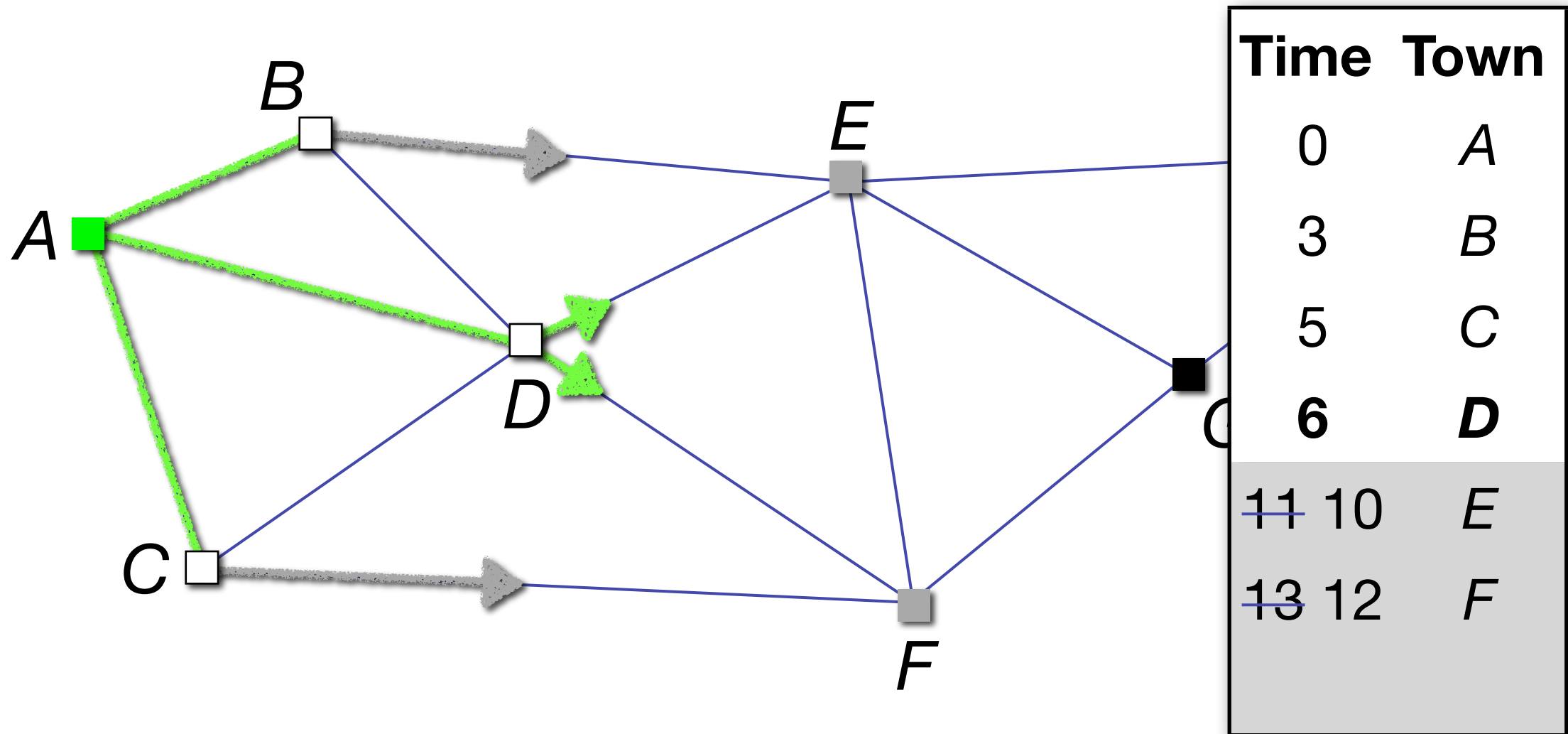
# Updating the agenda



# Keep advancing

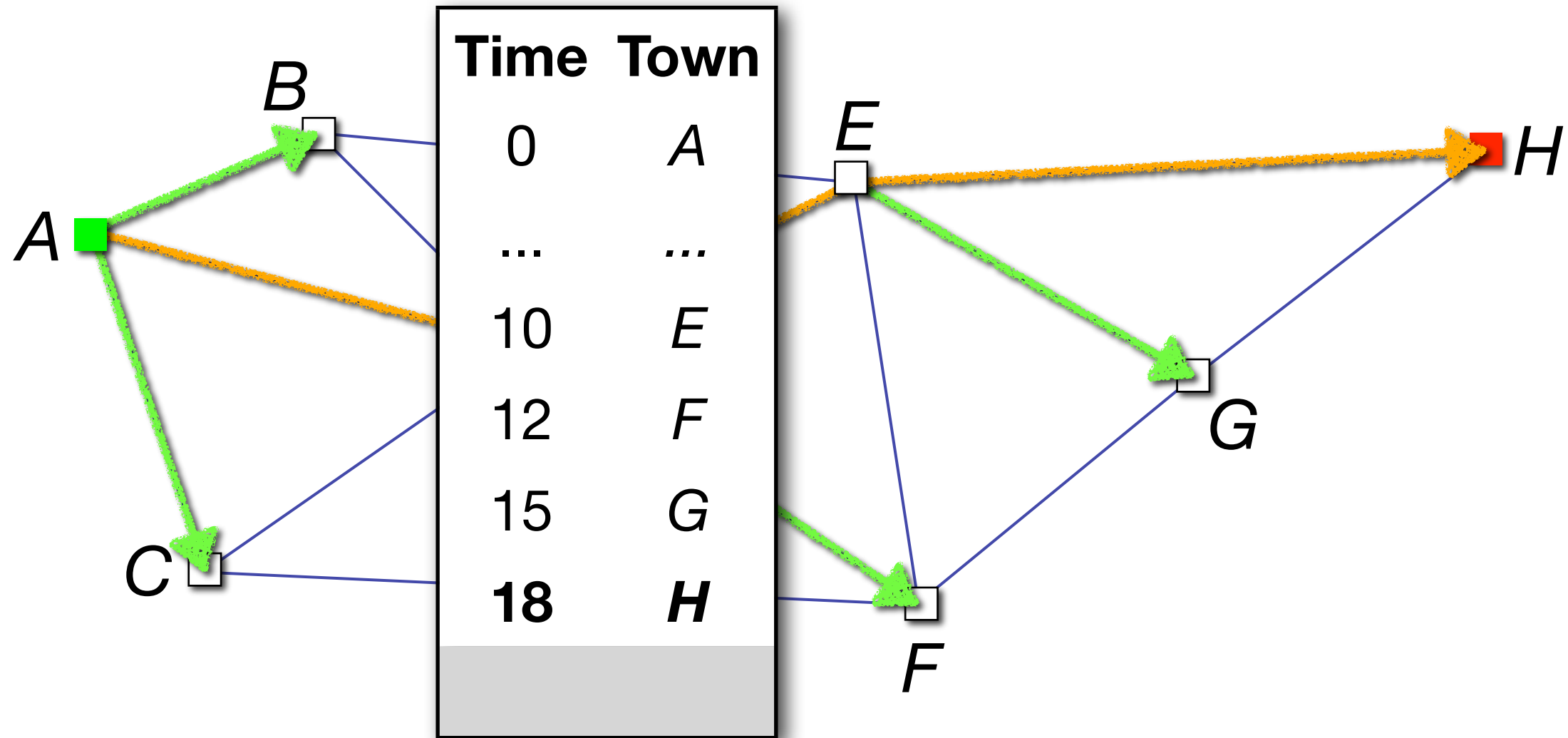


# Overtaking





# Reaching the goal



# Writing it as a program

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```
while (dest.colour != WHITE) {  
    t = choose_min();  
    t.colour = WHITE;  
    update_estimates(t);  
}
```

Java

# Writing it as a program

```
while (dest.colour != WHITE) {  
    t = choose_min();  
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    update_estimates(t);  
}
```

Java

```
while dest.colour  $\neq$  WHITE do  
    t := ChooseMin( );  
    t.colour := WHITE;  
    UpdateEstimates(t)  
end
```

Pascal

# Computer Science

- It's *not* about learning new programming languages.
- It *is* about understanding why programs work, and how to design them.

# Computer Science

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# Why Ox/bridge?

## Academic

- A rigorous approach
- Able and keen fellow students
- Teaching from world experts

## Social

- Rooms, books, meals
- Sport, politics, music, drama
- Making friends for life

## Career

- Boundless opportunities await

# Why CS at Ox/bridge?

- Computer Science from the start.

*You study just Computer Science from day one, and we assume no prior knowledge.*

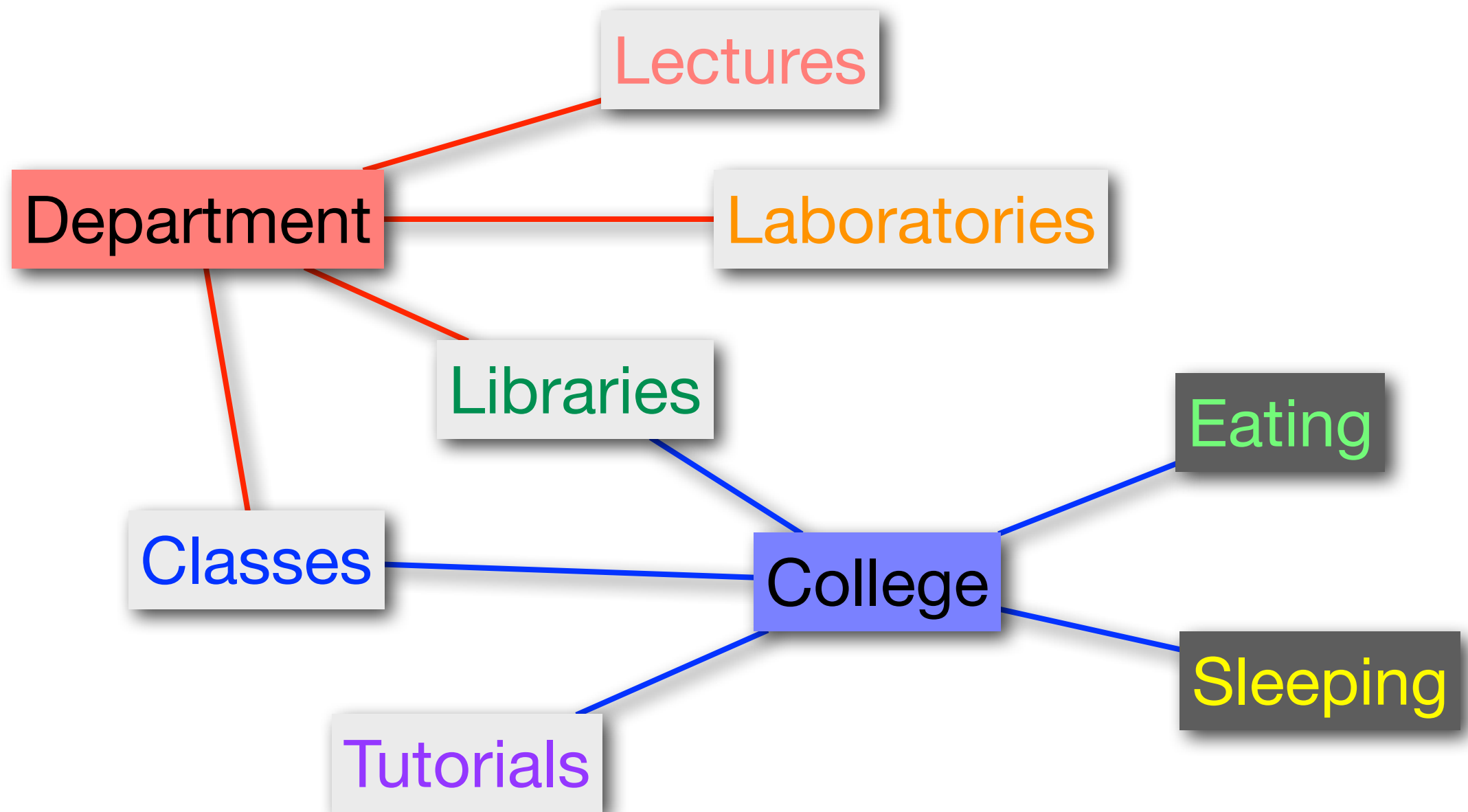
- Principles behind the technology.

*You will learn the latest technology, but you will learn lasting principles as well.*

- Personally-tailored tuition.

*Like all Ox/bridge degrees, our teaching revolves around paired or one-to-one tutorials/supervisions.*

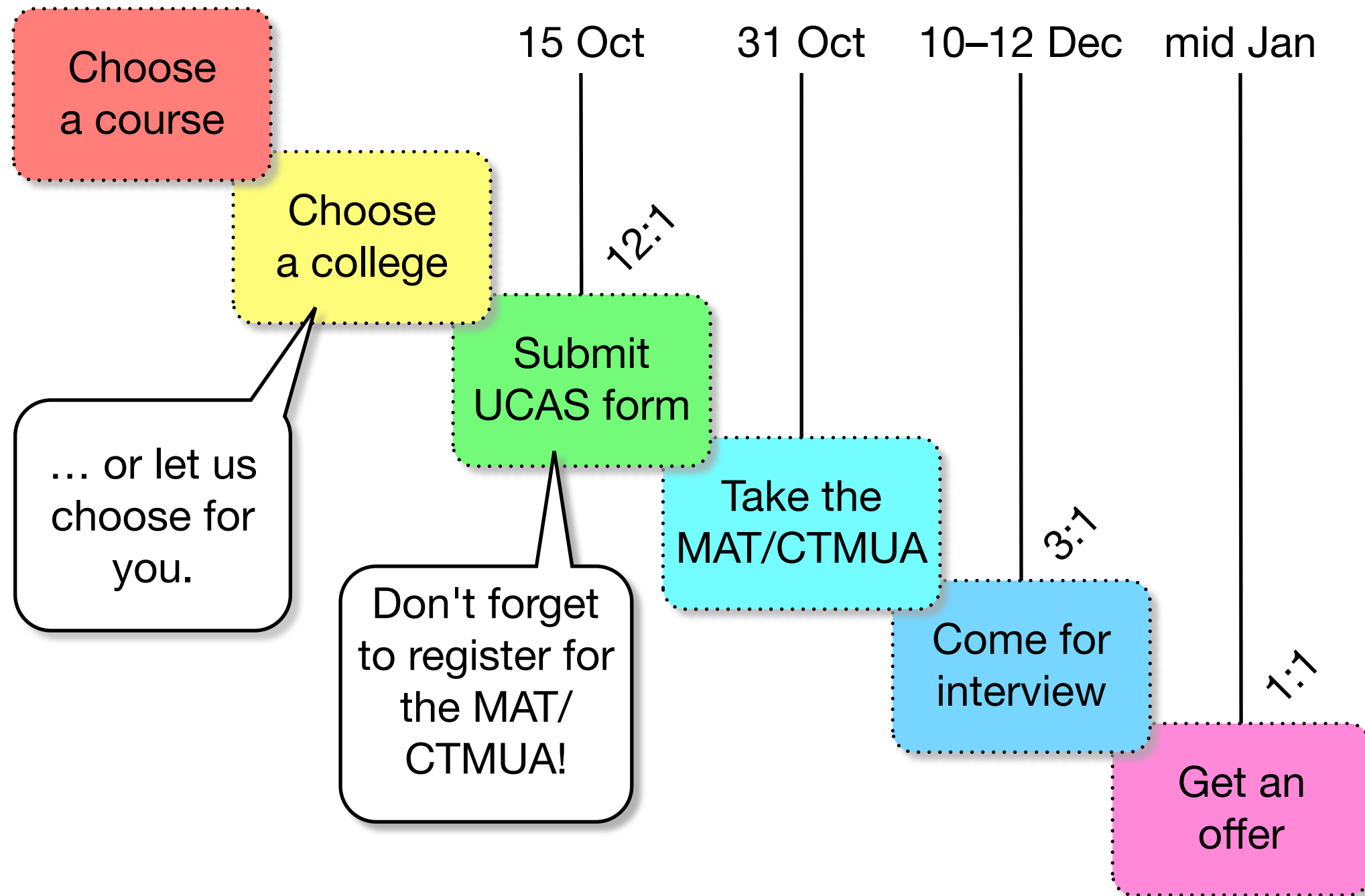
# Studying at Ox/bridge



# Computer Science

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# Applications timeline 2018



# Personal statement

- Be *personal* – What sets your application apart from others?
- Be *concrete* – Tell us what you have actually done.
- Be *specific* – Pick out highlights that paint a picture.

# Mathematics Aptitude Test

Based on the 'common core' of A level Maths.

- Plenty of past papers online.
- You need to score 55–60 to get an interview.

We use *contextual information* when deciding who to invite for interview.

# The interview

- We don't ask trick questions.
- We want you to explain things to us.
- We want to have a conversation with you.



# What are we looking for?

## Potential

What have you done, and what does it say about you?

## Ability

Given some information, what can you do with it?

## Motivation

Will you stay interested for 3 or 4 years?

## Independence

Can you work on your own with persistence?

## Creativity

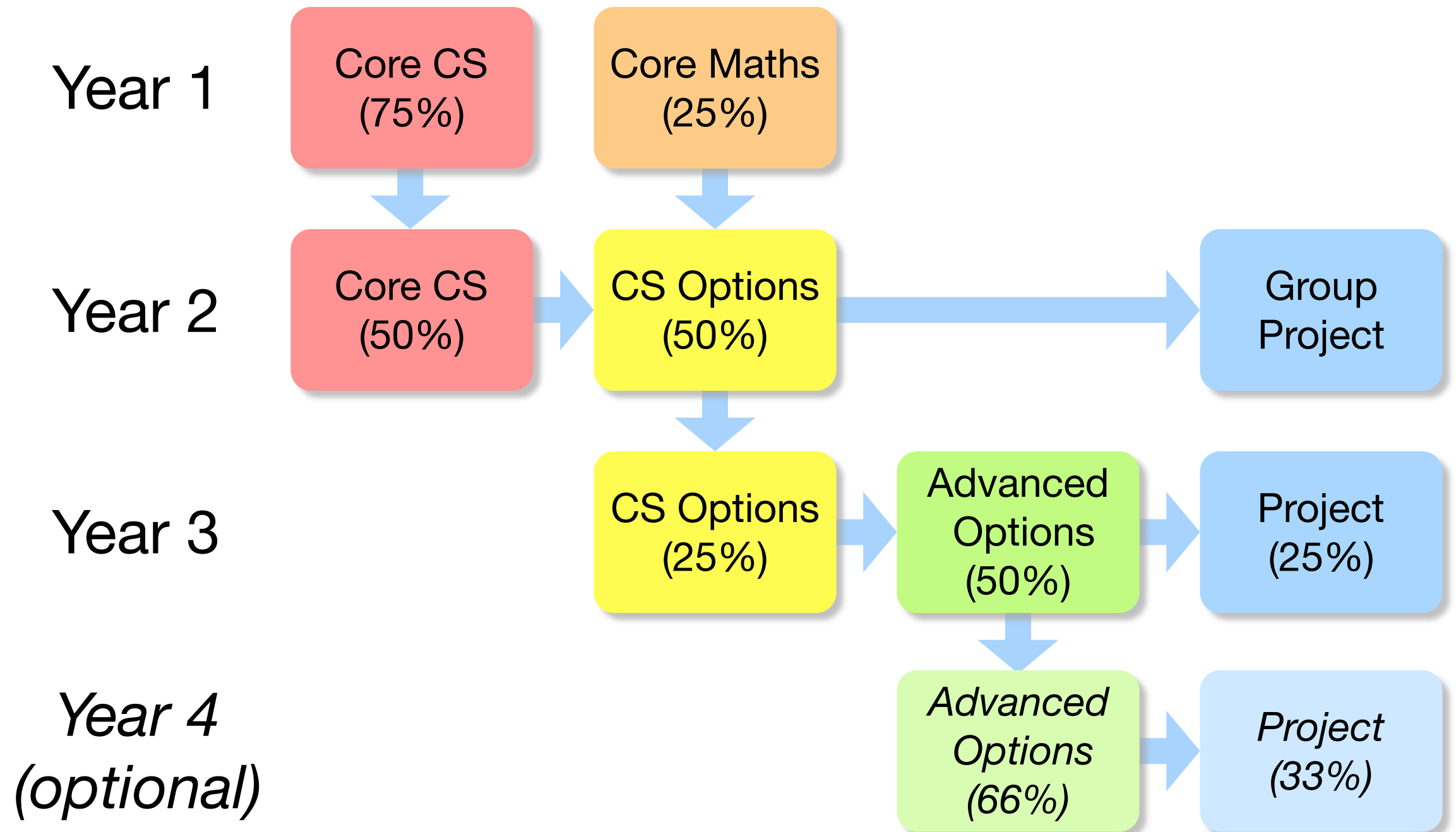
Can you develop and refine your own ideas?

## Hard work

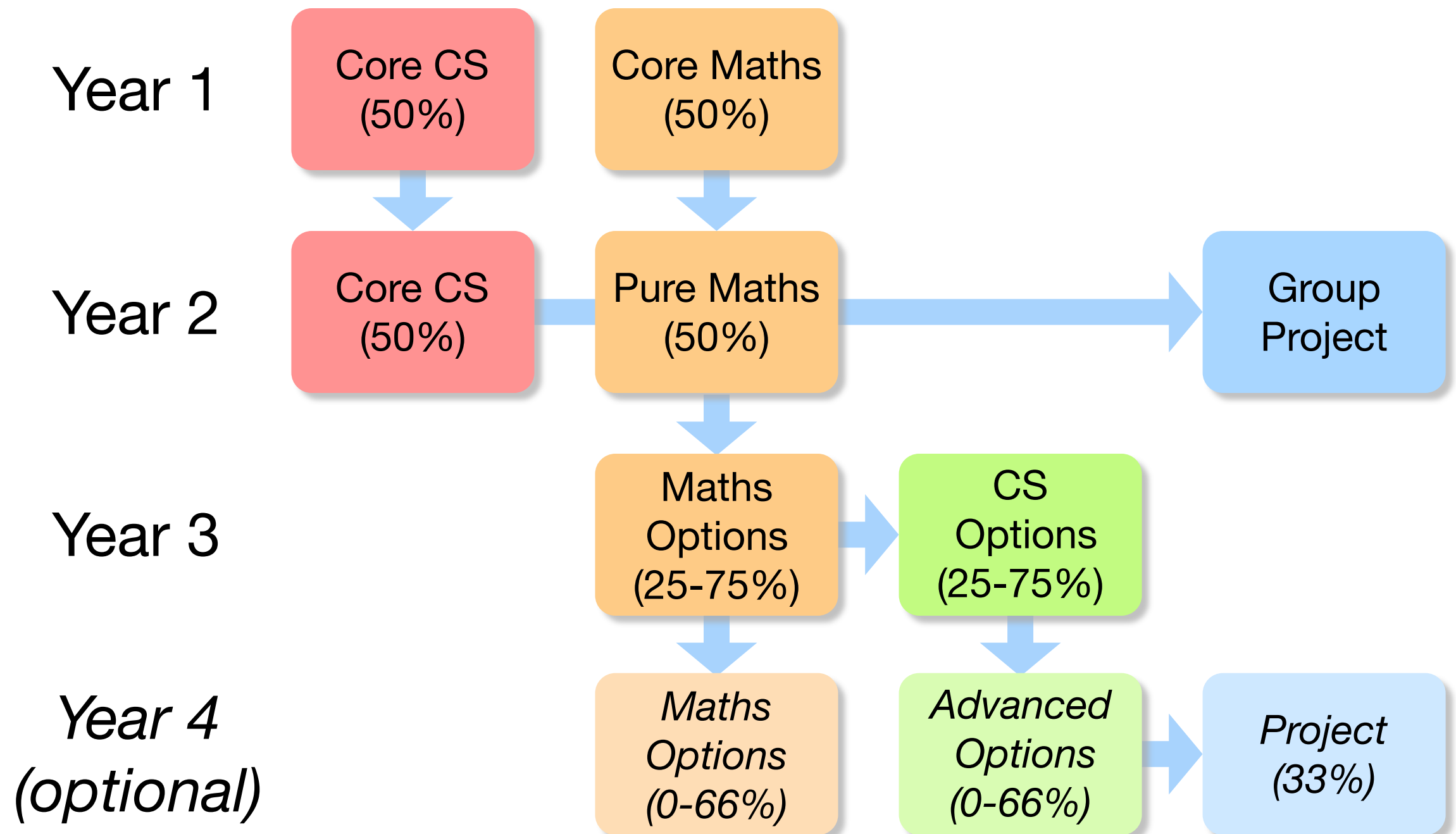
Do you give up easily?



# Computer Science



# Maths & Computer Science



# Computer Science & Philosophy

